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Table of Contents

Connectivism as a Driver to Improve Citizen Learning and engagement in Cognitive Cities: A Literature Review

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Abstract
Society has changed as a result of new technologies of the digital age. Therefore, learning theories such as Behaviorism, Cognitivism, and Constructivism, no longer support learning actions in a technological era; since these theories were developed at a time when technology had no impact on learning at the level it does today and they were developed when knowledge grew slower. Additionally, population is always increasing and as citizens, learning does not occur only inside the classroom but also outside the classroom, in society, where we learn from each other in a connected world. In this context, the concept of smart cities and cognitive cities is becoming more significant. As a result, Connectivism, a new learning theory for the digital age has emerged, which is the link that connects new technologies with citizens. However, the use of Connectivism in cognitive cities is not an area in which a great deal of research exists. Thus, the purpose of this research is to analyze how Connectivism, a learning theory for the digital age, has been used in cognitive cities to improve citizen learning and engagement. The results showed several approaches on how Connectivism has been applied. Therefore, this body of research provides an insight into Connectivism and extends our understanding on how this learning theory is generating citizen learning and engagement in cognitive cities.

Keywords: Behaviorism, Cognitivism, and Constructivism, Connectivism, Cognitive Cities; Learning; Technology and Information

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Introduction

Society has changed as a result of new technologies of the digital age. Furthermore, we live a knowledge explosion, what was considered to be powerful knowledge yesterday, is in doubt today, and may vanish tomorrow. AlDahdouh, Osório & Caires (2015) argue that "The time should be considered as a dimension of knowledge" (p. 12). This statement has encouraged Siemens (2004) & Arbesman (2012) to study the half-life of facts and they have concluded that the half-life of knowledge is shorter than ever.

Therefore, traditional learning theories such as Behaviorism, Cognitivism, and Constructivism, no longer support learning actions in a digital age; since these theories were developed at a time when technology had no impact on learning at the level it does today and they were developed when knowledge grew slower (Siemens, 2004). As a result, Connectivism, a new learning theory for the digital age has emerged, which is the link that connects new technologies with citizens. Connectivism, interprets learning happening outside the learners and calls it networked learning. In this context, the concept of smart and cognitive cities is becoming more significant.

However, the use of Connectivism in cognitive cities is not an area in which a great deal of research exists. Thus, the purpose of this research is to analyze how Connectivism, a learning theory for the digital age, has been used in cognitive cities to improve citizen learning and engagement. Considering that Connectivism is an area where not much research exists; this topic is fundamental.

Methodology

This study employed a qualitative content analysis approach. During data analysis, the researchers looked for themes and patterns of connections (Zhang & Wildemuth, 2009); they immersed in data, so that, different themes emerged.

The study passed through three phases. The first phase was to look for keywords used in search engines and digital libraries. The keywords were: Behaviorism, Cognitivism, and Constructivism; Connectivism, Cognitive Cities; Learning; Technology and Information. The second phase was to filter by: publication date, descriptors, sources, publication type, location, and language. Finally, the third phase was to analyze the data where abstracts, discussions, results, and conclusions were the main target. So, finally, main results occurred.

Findings

The following results show how the Connectivism learning theory is being used in cognitive cities.

Results showed that three broad learning theories have been most often used in educational environments: Behaviorism, cognitivism, and constructivism (See figure 1).

Behaviorism relates to learning as a change in behavior. It focuses on repeating a new behavioral pattern until it becomes automatic. It is a kind of teaching based on stimuli and responses, where the student does not appropriate knowledge and, the form of learning is usually by memorization. The learning success is measured by tests to accomplish each objective (Schuman, 1996). Some key representatives in the development of the behaviorist theory were Pavlov, Watson, Thorndike and Skinner.

According to Dembo (1994), *Cognitivism* is based on the thought process behind the behavior. Cognitivism suggests that learning is an internal process, where the learner cognitively processes the information. Changes in behavior are observed and used as indicators as to what is happening inside the learner's mind. A cognitive expert would analyze a task, break it down into smaller amounts and develop instruction that moves from simple to complex building on prior schema. The main representative of Cognitivism is Jean Piaget.

Constructivism is a philosophical position that knowledge arises through a process of active construction (Mascolo, 2005) Constructivism, a theory about knowledge and learning, describes both what knowing is and how one comes to know. (Jonasson, 1991) emphasizes that Constructivism describes knowledge not as truths to be transmitted or discovered, but as emergent, developmental, non-objective, and viable constructed explanations by humans engaged in meaning.

Constructivism assimilates learning as an active process where knowledge is built. Among the assumptions of Constructivism are: a) knowledge is built from experience, b) Learning is a personal interpretation of the world. c) Learning is an active process in which meaning is developed based on experience. d) Conceptual growth comes from the negotiation of meaning, the sharing of multiple perspectives, e) Learning should be situated in realistic settings, and f) testing should be integrated with a task, not a separate activity (Merrill, 1991, cited by Smorgansbord, 1997). In the same line, Social Constructivism was promoted by Vygotsky. He was a cognitivist, but he rejected the hypothesis made by Piaget that it was possible to separate learning from its social context. Some key representatives of the constructivist theory were David Ausubel and Vygotsky.
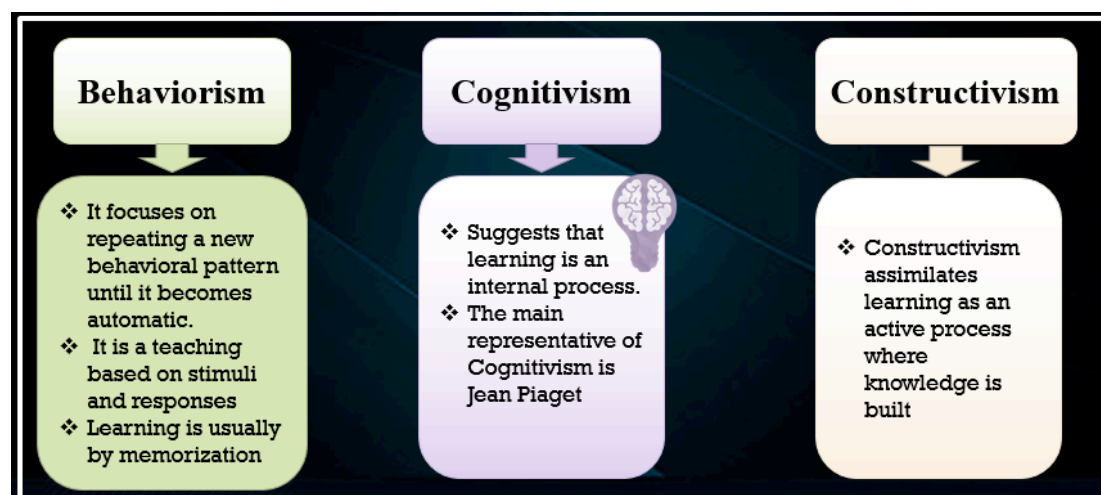
Figure 1: Learning Theories

However, according to Siemens (2004), learning theories, such as Behaviorism, Cognitivism, and Constructivism, have limitations because these theories were developed at a time when technology had no impact on learning at the level that it does today. In fact, these theories were developed when knowledge grew slower. These theories do not address learning that occurs outside of people (i.e. learning that is stored and manipulated by technology). They also fail to describe how learning happens within organizations. Due to those limitations, the Connectivism theory emerged. (See figure 2).
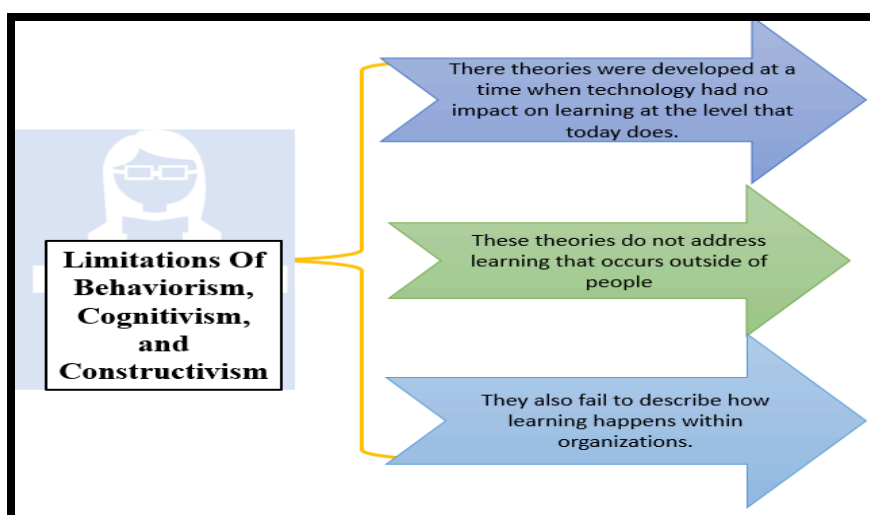
Figure 2: Limitations of Behaviorism, Cognitivism, and Constructivism

Gutiérrez (2012) claims that the concept of *Connectivism* is not new, this concept had already been raised with consistency in the work on socio-constructivism, in the article by Onrubia (2005, p.6), Processes of teaching and learning in virtual environments, in the theories of Conversation (Pask, 1975) and in general by Vygotsky -1978.

Connectivism is defined by (Siemens, 2004) as a theory of learning for the digital age, therefore, we can understand the emergence of this new trend in a social context characterized by the creation of economic value through networks of human intelligence to create knowledge. In this new scenario, technology plays a significant role in a society where the revolution of information technology has transformed the ways of doing business, the nature of services and products, the meaning of time at work, and learning processes (Fenwick, 2001).

Learning does not occur entirely under the control of the individual, learning can reside outside of ourselves, within an organization or a database. Siemens (2004, p.4) emphasizes the following aspects as the Principles of Connectivism:

Learning and knowledge rests in diversity of opinions.
Learning is a process of connecting specialized nodes or information sources.
Learning may reside in non-human appliances.
Capacity to know more is more critical than what is currently known
Nurturing and maintaining connections is needed to facilitate continual learning.
Ability to see connections between fields, ideas, and concepts is a core skill.

Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision. (See figure 3).
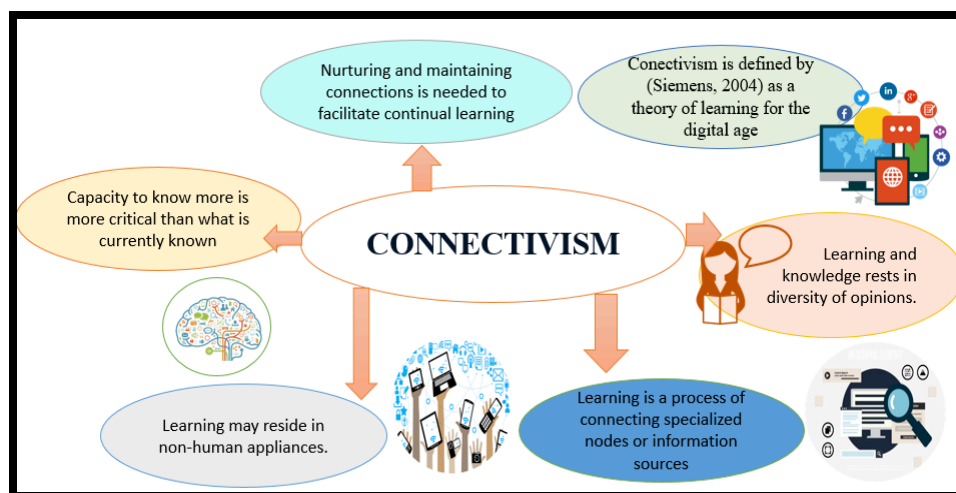
Figure 3: Connectivism

Thus, the Connectivism learning theory was created as a result of a belief that there was a need for a learning theory, which took into account the way in which society has changed as a result of new technologies for the digital age (Manzano et al, 2017). Additionally, population is increasing as well as citizens' needs and as citizens, learning does not occur only inside the classroom but also outside the classroom, in society, where we learn from each other in a connected world. In this context, the concept of smart and cognitive cities is becoming more significant.

Smart city is a concept for a modern city which is facing efficiency challenges. According to Machin & Solanas (2018), 54.5% of the world's population lived in urban areas in the year 2016. The United Nations estimates that, by 2030, this number will increase to over 60%, with one of every three people living in cities with at least half a million inhabitants and it is expected to reach over 70% by the year 2050 (United Nations, 2014). Such mega-cities will face enormous challenges regarding efficiency, sustainability and resiliency. With those challenges in mind, researchers proposed the idea of Smart City, as a way to fight against urbanization problems.

However, the new urban challenges cannot be addressed merely by ways of increased efficiency. These challenges relate to sustainability and resilience, requiring new and innovative approaches to urban governance. Such approaches will need to involve the "human factor", cognition, creativity along and the ability to learn so as to be able to deal with disruptive changes (resilience). This integration of the human factor within the smart city system creates cognitive cities.

Cognitive cities are smart cities, where the human factor is added. Finger & Portmann (2016) state that, cognitive cities are complex sociotechnical systems where it is not possible to address their challenges with technological developments and innovations only. The paradigm of cognitive city has emerged as a promising solution to the challenges that megacities of the future will have to face.

Connectivism in Cognitive Cities

Learning takes place in different ways. The following are some scopes where the Connectivism learning theory constitutes a driver to improve citizen learning and engagement in cognitive cities: (See figure 4).
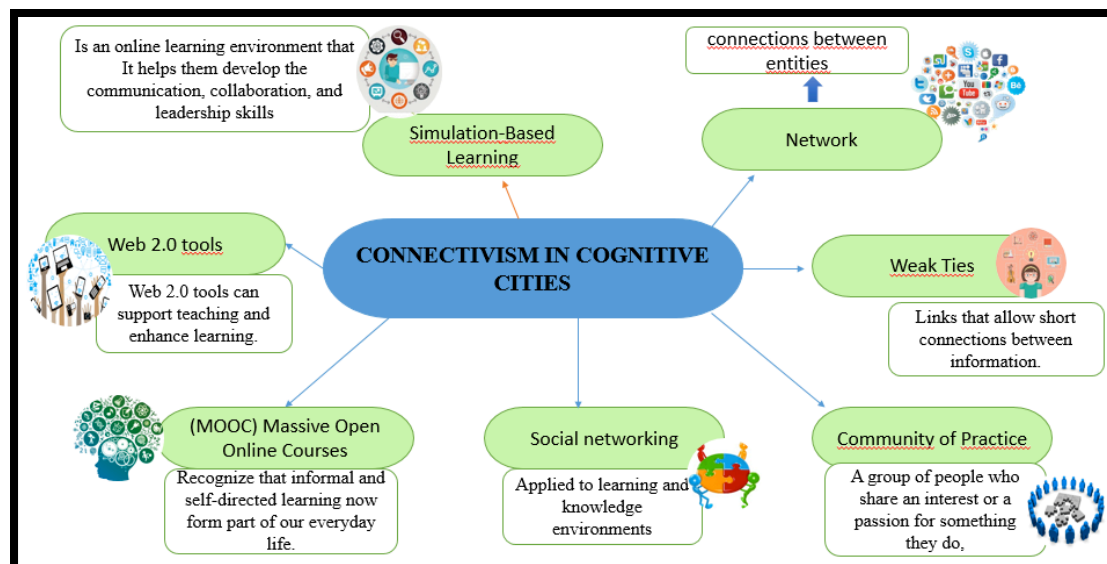
Figure 4. Connectivism in Cognitive Cities

Network

It can be defined as connections between entities. Computer networks, power grids, and social networks function on the principle that people, groups, systems, nodes, and entities can be connected to create an integrated whole. (Siemens, 2004). Nodes can be fields, ideas, communities that specialize and gain recognition for their expertise, thus resulting in cross-pollination of learning communities.

Downes (2008) claimed that Connectivism is a form of knowledge based on ideas spread in a Network. According to Siemens (2004), the starting point of Connectivism is the person. Personal knowledge is incorporated from a network, which feeds into organizations and institutions, which in turn feed back into the network, and then continue to provide learning to the person. This cycle of knowledge development (personal - to network - to organization) allows learners to remain up-to-date in their field through the connections they make.

Weak Ties.

According to Siemens (2004), weak ties are links that allow short connections between information. The small world networks are generally populated with people whose interests and knowledge are similar to each other. For instance, people finding a new job, often occurs through weak ties. Additionally, connections between unrelated ideas and fields can create new innovations.

Community of Practice

A community of practice is a group of people who share an interest or a passion for something they do, and they learn how to do it better as they interact regularly. Even though the phenomenon to which community of practice refers to is age – old, the term community of practice is of relatively recent coinage. Today, a growing number of people and organizations in several sectors are focusing on communities of practice as a key to improving their performance (Wenger, 2011). Three characteristics are essential: domain, the community, and the practice.

Social networking

Social networking theories and tools build new and effective e-learning practices. Pettenati & Cigognini (2007) argue that a social networking applied to learning and knowledge environments can lead to a reconceptualization of learning; in which formal, non-formal, and informal learning can be integrated as to build potentially lifelong learning activities to be experienced in personal learning settings.

Massive Open Online Courses (MOOC)

According to Kop & Fournier (2011). The propagation of Information and Communications Technology (ICT) in recent years has changed the educational landscape and helped in the creation of an overabundance of new opportunities for learning. Educators are changing their practice and are experimenting with open educational resources and cloud computing, such as Massive Open Online Courses (MOOC), recognizing that informal and self-directed learning now form part of our everyday life.

This new trend increases new opportunities and challenges for the self-directed learner. The learner might no longer rely on a trusted educator to support his or her learning work. The evolving technologies that are currently modelling the Internet and the Web provide us with access to information and the capacity to work and learn with others in a creative global collaboration outside the educational configurations that have been the standard for centuries (Downes, 2010; Fournier & Kop, 2010).

According to AlDahdouh & Osorio (2016), For-profit and non-profit companies have invested money and participated in the production of MOOCs. However, the integration and adoption of MOOCs in educational institutions around the world remains questionable. AlDahdouh & Osorio (2016) addressed the issues that higher education institutions should consider before adopting MOOC. Their findings showed eight interconnected and manageable MOOC issues: student assessment and language barrier, accreditation, business model, reputation, pedagogy, research ethics, and high dropout rate.

Web 2.0 tools

According to Siemens (2004) one of the most relevant theories, to come to prominence due to the rise of Web 2.0 is Connectivism. The use of Web 2.0 predominantly within Higher Education (HE) has become popular in recent years and consequently there is an increasing assortment of research concerning the way in

which Web 2.0 tools can support teaching and enhance learning. This trend has been led, particularly through the use of blogs to develop new forms of teaching, learning, pedagogy and learning theories under the connectivist theory.

Conole & Alevizou (2010) reviewed the use of Web 2.0 tools in Higher Education where they wanted to see evidence that Web 2.0 approaches are being used to foster and promote teaching scholarship and examples of teachers as learning communities. This study indicated that Web 2.0 tools offer features that have clear potential in an educational context to support a diversity of pedagogical approaches. Nevertheless, a number of challenges persist in terms of getting better implementation on these tools in education

Simulation-Based Learning

According to Lombardi (2007), Simulation-Based Learning, the Mekong e-Sim is an online learning environment. This online learning environment uses simulation and role-playing so that students get immerse in the complications of authentic decision making. It helps them develop the communication, collaboration, and leadership skills they will need to be successful practitioners in their fields.

Herrington & Oliver (2000) argued that, rich simulations of laboratories, clinics, schools, and other workplaces may expand the conservative internship experience in the future, if they offer learners immediate access to one another, to an extended family of mentors, and to the resources of the global network. As well, they highlighted that technological support for today's authentic learning environments commonly includes: a) High-speed Internet connectivity. b) Asynchronous and synchronous communication and social networking tools for the support of teamwork c) Intelligent tutoring systems, virtual laboratories, and feedback instruments that capture rich information about student performance and help students transfer their learning to new situations. And d) Mobile devices for accessing and inputting data during field-based research.

The following are some research and applications of Connectivism applied to solve citizens' problems:

The Meta-application

The Meta-application (meta-app) for cognitive cities presented by Kaltenrieder, Portmann, & D'onofrio, (2015) improves communication and thereby facilitates governance.

The Internet of Things (IoT) and the Web of Things (WoT)

As it is stated by D'Onofrio et al (2018), the Internet of Things (IoT) is used to create connections among smart things as well as between smart things and individuals. It is used in various applications for smart cities. Nonetheless, the IoT has several disadvantages, such as a lack of common standards, which are a requirement if many things as possible are to be connected. On the other side, the Web of Things (WoT), which is the IoT extended using Web standards, holds common standards and has many other advantages over the IoT. D'Onofrio et al (2018), states that when using

with the WoT, processes in cognitive cities, living standards can be improved. Thus, the WoT is appropriate for addressing the challenges faced by today's cities.

Fuzzy Cognitive Maps

According to D'Onofrio et al (2019), a primary task and an essential challenge is to process information in a city. Urban data are usually expressed in natural and imprecise language; however, they can contain relevant information that should be processed to progress the city. Fuzzy cognitive maps (FCMs) can be used to model interconnected and imprecise urban data.

Synchronizing mind maps and fuzzy cognitive maps

D'Onofrio (2017) presented a conceptual approach to improve knowledge management by synchronizing mind maps and fuzzy cognitive maps. When using mind maps, it is possible to take advantage of human creativity, while fuzzy cognitive maps can store and retrieve information expressed in natural language. By applying the concepts of cognitive computing, it makes it possible to gather and extract relevant information from a data pool. Therefore, this approach was intended to provide a framework that improves knowledge management.

Fuzzy Analytical Hierarchy Process (FAHP)

Kaltenrieder et al (2014) introduced a mobile application (app) as the first part of an interactive framework. The framework improved the interaction between cities and their citizens, introducing the Fuzzy Analytical Hierarchy Process (FAHP). This process acted as a potential information acquisition method to enhance existing citizen management activities for cognitive cities. Citizen management was improved by advanced visualization using Fuzzy Cognitive Maps (FCM). The proposed app took fuzziness into account in the constant interaction and continuous development of communication between cities or between their entities (e.g., the tax authority) and their citizens.

Knowledge graphs and fuzzy cognitive maps

Kaltenrieder et al (2015) gave an insight into cognitive computing for smart cities, resulting in cognitive cities. Cognitive cities and cognitive computing research with the underlying concepts of knowledge graphs and fuzzy cognitive maps were presented and supported by existing tools such as: IBM Watson and Google Now; and intended tools such as: meta-app. Their study illustrated FCM as a suiting instrument to represent information/knowledge in a city environment driven by human-technology interaction, enforcing the concept of cognitive cities.

Digital Personal Assistant for Cognitive Cities

Kaltenrieder et al (2016) presented an evaluation and initial testing of a meta-application (meta-app) for enhance communication and improve interaction (e.g., appointment scheduling) between stakeholders in cognitive cities. The results of the evaluation showed that the idea behind this meta-app has the potential to improve the living standards of citizens and to lead to a next step in the realization and maturity of

the meta-app. The meta-app helps citizens to effectively manage their time and organize their personal schedules and thus allows them to have more leisure time to take full advantage of it, and to ensure a good work-life balance to be more efficient and productive.

A dynamic route planning

Kaltenrieder (2019) presented a software prototype for dynamic route planning in the travel industry for cognitive cities. This prototype improves the travel experience for instance, sightseeing; by allowing additional flexibility to the user.

Creative Reasoning

Trillas (2019) introduced a first model of creative reasoning in a naïve way. A mathematical structure based on ordinary reasoning was elaborated to allow 'creative jumps' in reasoning, by presenting formal deduction. Aspects of natural language as well as of human thinking were mentioned to emphasize the importance of creativity in human life as well as in cities, considering the existing imprecision and uncertainty in natural language. This work could give the first hints of a possible mathematical model to enable creative reasoning in cognitive cities.

Big Data

Morabito (2015) discussed the transformation of the public service provision model due to big data, and in particular due to public engagement in the context of open government initiatives. The author deliberated 1) The use of a new sources of data, such as Crowdsourcing, Internet of Things, 2) public talent engagement, 3) institutionalize private–public partnerships and 4) searching for new models of value-for-money public provision, in addition to the challenges that big data present. Different aspects of this discussion were demonstrated through two case studies: Barcelona Smart City and Haiti's emergency support during the 2010 earthquake disaster.

Implications and Limitations

We agree that certainly, traditional theories present limitations because they were developed at a time when technology had not much impact on learning at the level it has today. Therefore, Connectivism (Siemens, 2004) appears as the learning theory for "the digital age"; since, technology today is a powerful instrument that revolutionizes information and transforms the world. The current communication and cultural environment has as its main component information and communication technologies. Additionally, new generation students were born in a digital environment and the behaviors associated with it are opposed to those expected in a traditional education.

Several options are presented in this study, where citizens can interact and get connected to information networks that allow people to learn, build, and share knowledge; such as communities of practice, Web 2.0, networks and so on. On the World Wide Web, Connectivism promises to establish learning spaces through so-called Massive Open Online Courses (MOOC), blogs, Webquests, and many others.

The variety of options makes learning and teaching innovative with the use of different sources, tools, methods and ways to share information among people interested in learning. However, in order to implement them in an appropriate way, great challenges must be analyzed, such as access to internet connectivity, virtual laboratories, and mobile devices, among others.

Additionally, applications such as Meta-applications, the Internet of Things (IoT) - the Web of Things (WoT), fuzzy cognitive maps. - synchronizing mind maps and fuzzy cognitive maps, Fuzzy Analytical Hierarchy Process (FAHP), digital personal assistant for cognitive cities, a dynamic route planning, creative reasoning, and big data are being developed to solve city problems and citizens' needs.

Some critics to Connectivism also appear. This is the case of Clarà & Barberà (2014) who examined the theoretical postulates of Connectivism and identified three important psychological and epistemological problems: 1) The lack of a solution to the learning paradox, 2 The under conceptualization of interaction, and 3) The inability to explain concept development. Some of the theoretical deficiencies may explain certain learning problems experienced by participants in MOOCs. The authors concluded that, although MOOCs are a worthwhile experience and ought to be continued, Connectivism as a learning theory has significant theoretical problems and should be deeply revised if it is to explain and foster learning in such environments.

Without doubt, Connectivism, a learning theory for the digital age, is a topic that needs the attention of investigators, because it is a new, updated, important and relevant topic.

Developed countries are working towards needed changes in city management, where Connectivism is the base of Cognitive cities. It assumes that knowledge is built through the experiences and perceptions of diverse people. Hence, the design of a cognitive learning process in a city is crucial (D'Onofrio et al, 2019). In this sense, a broad of opportunities are emerging in an unconscious way in non-developed countries too such as Ecuador where one of the research lines is dedicated to development, Innovation and Knowledge Transfer in ICT. Therefore, educators, investigators, and policy makers, should consider this research line to develop their plans in a cognitive cities arena.

Future research will focus on methodologies used for learning in Connectivism.

Conclusion

In a digital age education and cognitive cities need Connectivism to create better learning environments and a better and more practical citizen lifestyle, searching for efficiency, order, and progress that our society needs.

In Connectivism the two general ways to acquire knowledge include: pulling knowledge from personal experience and learning from others. In this way, Connectivism supports learning from each other by making connections. Additionally, in the Connectivism theory, learning is a process of connecting specialized nodes or information sources where learning can reside in human and non-human appliances. Consequently, when talking about connections, the sources

are not only technological sources, but they can also be experiences, facts, ideas, and communicative learning environments, among others.

Thus, because of the several applications of Connectivism, mentioned in this study, where information / knowledge is shared in the society or city environment driven by human-technology interaction enforcing the concept of cognitive cities, we conclude that the Connectivism learning theory constitutes a driver to improve citizen learning in cognitive cities.

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A Critical Appraisal of a Teacher Development Course on the Teaching of Reading Skills at a Macau Middle School

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Abstract
This paper examines the effectiveness of a teacher education course delivered at a Macau middle school to a group of in-service English teachers and its implication for the field of teacher education. The course was centred on the teaching of reading skills and based on a theoretical framework, which could be described as broadly based on communicative language teaching (CLT). The teachers who took part in the course were given the opportunity to complete short questionnaires about their experience on the course and make themselves available for semi-structured interviews. Fifteen of the eighteen teachers who took part in the course completed questionnaires and five interviews were carried out. Interviewees were self-selecting but covered a range of teaching experience. The findings indicated that while participants found some value in the teacher education, the prevailing view was that many of the input items delivered either needed major adaptation or were unsuitable for the context in which classroom teaching took place. As a result of this, a more systematic acquisition of contextual knowledge is recommended, before in-house teacher development is offered in any individual school.

Keywords: teacher education; teacher development; context; reading skills

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Introduction

This paper examines the effectiveness of a teacher development course carried out at a Macau Middle School. The ages of the students in the school is between eleven and eighteen years. The focus of the course was on developing the teaching of reading skills within the school. Eighteen teachers took part in the teacher education course, which took place in June 2016. Some of the teachers had previously had taken part in teaching courses delivered by my institution, both within the school on specifically designed programs, or in more generic courses delivered to teachers from across Macau and funded by the local education bureau (DSEJ).

The teacher education provided consisted of six three hour 'input' sessions, which despite the title of 'input' contained a number of interactive elements and was conducted in a workshop format. Within the focus of reading skills, areas covered included reading strategies such as skimming and scanning, annotation, identifying main ideas, guessing meaning of words from context. Also included in the program were an examination of the structure a reading skills lesson, sentence and text structure, integrated skills, student motivation and online resources. There were also sessions on planning from the textbooks used in the school and a number of ready-to-use classroom activities were presented. From the point of view of my Centre, the unstated or assumed aim of the course was to improve the standard of the teaching of reading skills in the school, though this aim was not discussed explicitly it fitted in with the titles of other courses presented at our Centre, such as "How to teach reading".

Literature Review

Prevailing techniques in reading instruction in the Asian context

McAllister (2011, p.161) argues that in the Asian context, there is too much intensive reading, which he argues is "poorly taught". Li and Wilhelm (2008, p. 96-97), in their study of mainland Chinese Middle school teachers, argue that teachers view reading as simply a bottom up decoding process and give little strategy instruction or emphasis to micro-skills. McAllister (2011, p. 161) gives the following, arguably quite judgemental account and assessment of an Asian teacher's Middle school lesson.

> She begins by pre teaching a number of difficult words specific to the text, then tells the students to read the text and answer the questions that follow. When they have done this, the students exchange books and mark each other's work. The teacher calls on students to read out their answers, and says whether the answers are right or wrong. Thus, teacher and students think, reading has been taught.

Though some aspects of this approach were visible in the Middle school in this study, it may be questioned whether the last sentence can be in any way helpful in a teacher development approach. It makes the assumption that the person speaking has a categorical answer on how reading skills should be successfully taught, while no research based answer exists to this question. It is also highly dismissive of the contextual knowledge base of the classroom teacher.

Zhang (2003 p.305), in his overview of research studies within the Chinese context, of which Macau is a part, makes the striking assertion that "It is unfortunate that most often there is no marriage in reality between research findings and classroom practice". It is difficult to see how such sweeping statements could assist in teacher education, as they diminish and invalidate the hands-on experiences of the teachers themselves.

Promoting learner autonomy and independent readers

Within the Asian context there has arguably been a tendency towards simply walking students through texts and explaining the meaning to them almost line by line (McAllister, 2011). It was then, a further underlying assumption of the teacher education course provided, that the role of teaching instruction was to promote strategic readers who could use techniques taught independently. (Grabe, 2004, p. 53). McAllister's (2014, p.395) point that classroom instruction on reading should help students "be better learners tomorrow" is accepted. As most reading is likely to take place outside the class, the idea that students should be assisted to "transition from reading with support in the classroom to being maximally independent" (Watkins, 2011, p. 10) was a premise that informed the course delivered to teachers.

Perspectives on teacher training and teacher development

This paper focuses on a short professional development course for in-service teachers at a Macau Middle school. The context statement will describe this in more detail. It seems appropriate at this point in the literature review to examine issues related to teacher development.

Richards (1989, p.2-7) contrasts a training and development approach to teacher education. The training approach emphasizes the trainer as the expert and the participants as passive recipients of knowledge. A teacher's existing knowledge is seen as a "hindrance' in this approach. A development approach, on the other hand values what teachers already know. Richards (1989, p.7) describes this as a "non-deficiency approach' – the teachers are experts on their own context, usually more so than the trainers. As Freeman and Johnson (1998, p.398) state, trainee teachers are "not empty vessels", so disregarding their existing knowledge represents a disregard of valuable knowledge. Hayes (1995, p.258) makes the point that professional development sessions should give teachers the opportunity to present what they currently believe. Mann (2005, p112), makes the point that "bottom-up teacher development is not only crucial to individual language teacher development but for the teaching profession as a whole".

Effect of context on teacher education

Freeman and Johnson (1998, p. 410) make the point that "teaching as an activity cannot be separated from either the person of the teacher as a learner or the context of schools and schooling in which it is done". Any teacher educator should make every attempt to familiarize him or herself with the context in which the training is taking place, for maximum benefit to be accrued. In the present case, there was little attempt at contextualization, and that which took place was initiated by the teacher educator before the course, in the form of two class observations.

Mann (2005, p.112) advocates a need to move away from a "one size fits all" approach to teacher education and that courses should be context-based. Bell (2005, p.260) criticizes the notion that there is one methodology which is suitable across varying contexts. Bax (2003) believes that "implicit focus on methodology leads us to ignore one key aspect of language teaching—namely the particular context in which it takes place". Contextual factors which may be ignored include the physical space in which classes take place as well as learner and parent beliefs about what constitutes effective teaching (Brown, 2009, p.53-56).

In their study of the effect of teachers beliefs on their classroom practice in Macau, Fong and Jones (2005, p.1) make the following statement.

> Teacher education is supposed to enhance the effectiveness of teachers' work. However, in education and language education research it appears that many teachers rely more on their deeply held beliefs about teaching than on the knowledge and skills they learn from teacher education and professional development programs.

Littlewood (2007), writing from the Hong Kong context, which is demographically and geographically close to the Macau context, argues that teachers can be encouraged to adopt some more communicative based teaching practices with some adaptation, while retaining some more, in his words, 'traditional' practices.

Research Questions

The research questions deal with the efficacy and suitability of teacher development programs delivered by my institution. The following research questions were formulated:

1. To what extent teachers have applied the methodology and activities presented on the teacher education course and what are teachers' rationales for application/non-application of the above?

2. What are teachers' attitudes towards teacher education courses?

3. What modifications could be made to the process of designing future teacher education programs?

Methodology

Issues with conducting educational research in Macau

Qualitative Methodology

Eighteen teachers took part in the teacher education course and fifteen of them responded to the questionnaires. Owing to the small sample size, and the non-generalisability of the data, a qualitative methodology was selected.

Questionnaires

Regarding data collection, the teachers were provided with hard copies of the three item questionnaire and these were then returned to the researcher. Questionnaire data were collated in a number of categories to identify any prominent trends. For example 'specific activities' and 'classroom technology'. After the transcripts were created they were then re-read and colour coded to identify broad topic areas and areas where more than one participant covered a similar theme.

Semi-structured interviews

The starting point for the interviews was the questionnaire completed by the respondent, which I had in front of me as I conducted the interviews, but these themes were then developed in greater depth, and new themes relevant to the research questions were introduced by some of the interviewees. Five interviewees were self-selected.

Each questionnaire included a tick box on whether the respondent was willing to be interviewed. Interviews were conducted in a private place at the school and recorded and later transcribed.

Ethical considerations

Participants were guaranteed that data collected from them would be used anonymously. Other ethical considerations were discussed in the section on doing research in Macau.

Findings and analysis

Of the 18 participants who took part in the teacher education course on reading skills, 15 returned completed questionnaires.

Questionnaire data

Changes in ways of teaching reading skills in the last two years

Some time had passed since the teacher development course, which had the disadvantage that the course may not be totally fresh in the respondents' minds. However, it had the advantage for this research of giving participants time to reflect on how their teaching of reading skills had or had not developed since the original course and could capture more longitudinal changes, if they were present.

The following table shows categories, which received more than one mention in the questionnaires received.

Type of change in teaching	No. of respondents (n=15)
Specific activities mentioned by name	5
Greater use of educational technology	3
Not 'explaining texts' as much (walking students through the text	2
A more explicit approach to improving student motivation	2

The most common responses to the above question related to specific activities which had been presented during the teacher education course, rather than any theoretical material.

The second most common was educational technology. One of the teachers, said "my reading lessons involved more activities and some apps and websites".

One aspect present in the literature of the teaching of reading skills in an Asian context and through this researcher's anecdotal experience, is a tendency to 'walk students through' texts, rather than teaching them transferrable reading skills. One very experienced teacher made the following remark:

> A couple of years ago, I thought a reading lesson was very much focused on the topic itself because as a teacher I was supposed to explain and give as much information as possible to help students understand the reading passages. However, I have changed from such a content-based perspective to a more skill-based one.

It is interesting that only one respondent mentioned this course aim explicitly, and only one more – an experienced teacher, mentioned a shift towards promoting learner autonomy. Other respondents additionally mentioned related concepts such as reducing the pre-teaching of vocabulary and more student-centredness in the reading class. The teacher quoted above mentioned the word 'facilitator' (the teacher's own description of their current approach), which is in contrast with the "teacher explains the text to the students" approach to teaching reading.

Questionnaire data – What is important for students to learn in reading skills lessons?

This question was aimed at investigating how closely teacher perceptions correlated with the assumptions behind the teacher education course and theories present in the literature.

The following table shows categories which received more than one mention in the questionnaires received.

What teachers consider important for students in reading	Number of respondents (n=15)
Reading speed/fluency	5
Exam strategies	3
Guessing meaning of vocabulary from context	3
Critical or active reading	2
Reading for main ideas	2
Skimming and scanning	2
Prediction	2
That reading is integrated with other skills	2
Grasping the writer's point of view	2

The most commonly mentioned factors were reading fluency and speed, which were mentioned by five of the respondents. As one respondent put it, "I'm teaching students in senior form, so it is important for them to learn how to get the answers for the comprehension questions quickly, even if they don't know some words in the passage". Though the respondents described this as fluency it might be more accurately viewed as greater efficiency in terms of finding answers to assessment items. One participant stated that "students should be taught scanning and skimming skills in reading lessons, which allow students to obtain the main ideas of the articles.

The next most commonly mentioned item was the teaching of exam strategies, which is perhaps not surprising in an exam focused society like Macau, where, in addition to school exams, IELTS is also very popular. One respondent prioritized "scanning and skimming strategies and exam taking strategies, especially those related to standardized exams".

A number of other micro skills were mentioned by respondents, including reading for main ideas, guessing the meaning of unknown words, critical reading, active reading, prediction and "grasping the writer's point of view". Two respondents also mentioned the importance of integrating reading with other skills.

Questionnaire data – What makes a professional development course useful?

The following table shows categories which received more than one mention in the questionnaires received. A full list will appear in appendix two.

What teachers find useful on a professional development course	Number of respondents
Practical skills	4
Information about current educational technology	3
Opportunity to refresh skills	2
Teacher education should be more closely based on context, including large class sizes	2
Demonstrations of activities	2
Provision of resources	2

The most common answers to this question focused on 'practical skills', which is consistent with the focus on activities noticed in the answer to the previous question.

Also consistent with this was that three of the respondents specifically mentioned educational technology as an area they would like to focus on. Many of the disparate comments were summed up by one very articulate response from an experienced teacher, which listed the following points, which might be a suitable starting point for planning future courses at the school. She said that for a course to be effective:

1. The course is designed with a good balance of theories and practical applications.
2. The course introduces flexible and inspiring teacher pedagogies, from which teachers can adapt for classroom applications. This is particularly true with technological tools and resources, which are constantly changing.
3. The course engages teachers with in-depth discussions or exchange of teaching experiences.
4. The course provides useful teaching resources, including those online or electronic.

Interview Data

The respondents

Interviewees were anonymous. Five teachers at the school were interviewed and these teachers are referred to as teacher one, teacher two and so on. While this was a sample of convenience, as the teachers had volunteered to be interviewed, a balance was achieved between greatly experienced teachers and their more newly qualified colleagues.

Awareness of theories in teaching reading

Overall, the interviewees displayed a thoughtful approach regarding the teaching of reading, but tended to focus on different areas in their responses.

Teacher Three, while mentioning skills such as skimming and scanning, placed an emphasis on collocation and being able to use new vocabulary actively. Interestingly, this seems more in line with the aims of a vocabulary lesson than a reading skills lesson. This teacher also saw guessing meaning from context as a very worthwhile activity. Teacher Four, the most experienced teacher in this group listed skills such as reading for specific information, details and guessing from context as "useful skills" for students. Teacher Five, currently teaching a higher-level class also focused on skills which involved deeper processing on the part of the students as well as seeing the value in integrating skills, in this case reading and writing. This teacher identified the most important points as " identifying concepts, referents, - all those theories – the details – for advanced class students what they need is giving them more chance to express their opinions afterwards – to reproduce something from the reading material".

Effects of the teacher education course on classroom practice

Given the fact that most of the teachers in this study seemed to have had a lot of experience regarding various theories of teaching reading, attained both from this course and many others, a fundamental question of this work is how far teacher education influences classroom practice?. A limitation of this research is that data

here only reports what teachers on the course say about classroom practice, rather than presenting data from actual observation. There is a danger of respondents telling the researcher what he wants to hear. Steps were taken to avoid this being the case, such as assuring the teachers that the focus was on how we could deliver more effective and targeted teacher education courses. In addition, the researcher attempted to create an atmosphere in the interview which encouraged critical analysis, with, for example, positive facial expressions and gestures when critical comments started to be expressed.

All the interviewees mentioned modifications which they had made to their teaching as a result of the course, some focused on specific activities they had liked and adopted and some appeared to allude to a more significant shift in their approach to the instruction of reading skills. The most marked shift was in the attitude of the least experienced of these teachers, Teacher Three.

> In the first two years I just taught some new words because vocabulary is a big problem for my students because they don't know too many English words. OK, the words they use are always easy therefore I focused on teaching them vocabulary but after that….after taking your course…some other courses, I realized that actually vocabulary is not the most important thing. It's important but it's not the most important thing. The most important thing is to ask them to guess the meaning from the context first, I mean that's how they're gonna read.

This is an interesting point, because though it shows that the teacher has reflected on and used reading strategies presented in the course, their interpretation does not exactly coincide with that of the teacher educator who conducted the course. I.Nation (2006, p.60) indicates that for academic study, which is an ultimate goal of some of these students, a receptive vocabulary of 8,000-9000 words is required, so it does not seem justifiable to diminish the importance of vocabulary in reading. It was not the intention to underestimate that vocabulary was important, rather to modify the practice of arguably excessive pre-teaching of vocabulary and of walking students through texts line by line. This raises the point of the gap between what teacher educators intend to convey and what the teachers on a course actually take from it.

Teacher Two, another relatively inexperienced interviewee in the group also mentioned that she had previously taught reading in the manner explained above of guiding students through the text and simply explaining the content. In this teacher's words "In the first moment when I taught reading I taught them all the new words, like it could be 12 new words before reading a passage, but after I got training from you I may have pre-taught or 4 words". As Watkins (2011,p.9) states, "Too much pre-teaching may move the focus of the lesson away from developing reading skills and toward learning vocabulary" This teacher also mentioned a possible clash between what they saw as best practice, and both student and parent expectations:

> I expect reading to be combined with writing or listening ..we can combine all the skills together but students, what they expect is to explain all the words, all the meaning of vocabulary and analyse them and they get a high score in the English test. For parents, they expect them to do better in exams.

Teacher One mentioned that they had successfully employed integrated skills activities based on communicative language teaching and had enjoyed particular success with jigsaw reading. She contrasts this with what she said was her previous experience of teaching in a "lecturing style" something she had "mostly" done in the past.

Theory and Practice – Contextual Factors

Interviewees' views on contextual factors were elicited during the interviews. One reason was to probe gaps between theory and practice. Questionnaires and interviews indicated that teachers fully understood the strategies which were covered in the course, such as the teaching of sub skills and the structuring of a reading skills lesson around before reading, while reading and after reading activities, but earlier evidence from classroom observations carried out as part of the teacher education course indicated that these practices were not always incorporated into actual teaching.

One issue with applying theories from the teacher education centred around their practicability in relations to student behavior. Teacher One put this succinctly:

> Well, maybe some of the theories of the ways, the approaches, should be effective, however, they are difficult to apply in a real classroom

It seems that Teacher One is imagining that the approaches they are talking about here would be effective if they were practical, in effect that they might be successful in some idealized, abstract classroom but not in the real context in which they were operating. An attitude like this is thought provoking and challenging for teacher education, as it seems to present a deficiency model. Perhaps the teacher thinks that the approaches do not work because the students, the context or even the teachers themselves are somehow deficient. This is not an attitude likely to be conducive to teacher development.

Another contextual factor mentioned by more than one respondent was that of class size and whether some of the activities presented on the teacher education course were suitable for larger classes. Teacher Two addressed this directly:

> Because most of the theories we learned in University or in (my institution) – they are based on researches for small group …small classes but you know we have large class(es) like 30-40 students, so we have to be efficient, erm, it's quite difficult to really do everything according to theory.

This response seemed to be at the heart of the present research, so the researcher asked the respondent how useful the approaches taught on the course had been. Teacher Three remarked that "those things are useful but not quite – cannot be really applied to my students so I just did it a little bit".

This data suggests that in designing and executing teacher education in any specific context, class sizes need be a primary consideration in the advocacy of any activities or approaches. A potential problem, based on anecdotal evidence, is that many teacher educators have far less experience of dealing with large classes than their teachers who take part in their courses. Without spending sufficient time absorbing the context

in which teachers must work it can be questioned how far their role as "experts" is justified.

Teacher Two also mentioned constraints imposed by physical factors in the classroom. This teacher mentioned that "I find it very difficult to use the activities you introduced in our classroom. I'm not sure you've noticed our desks and chairs. They are fixed. It's very difficult to move them around". For the teacher educator these physical factors need to be considered in the course design. There needs to be explicit thought and discussion into how activities can be adapted to suit the physical space, or if they cannot then they should not feature on the teacher education course.

To conclude this discussion of theory and practice, it appears that for this in-house teacher development course, there was some disconnect between the two. This is a very real issue for any context in which a large number of "teacher training" courses are run. If theories are seen as just that, no more than theories, but not really relevant to the day to day practice of teachers then there needs to some reflection and re-evaluation of how these courses are designed and delivered. Courses must genuinely be 'tailor made' in the truest sense in order to applicable in the context in which they are delivered.

How these teachers believe teacher education courses could be improved upon

While teachers on the course had some positive things to say about the approaches, methodologies and activities which comprised the course, a majority of the interviewees felt that professional development courses, in general, including the one under discussion failed to fully take into account contextual factors and that for this reason teacher education courses could be made more efficient and targeted. This should surely be the aim of any in-house training course, which claims to be "tailor-made" for one school.

Suggestions made in these interviews pertained to the pre-course preparatory phase. When asked about how teacher educators could learn more about a specific context Teacher Two suggested that it would be a good idea to "talk to the teachers. I know it's very time-consuming. Ask to the teachers who are actually teaching and not the management. Ask them the problems, what difficulties they have". Ideally, this might be in a focus group style meeting before the course takes place. Alternatively, initial sessions might be shifted more towards round table discussions of this kind.

Teacher Two's advice for the prospective teacher educator conducting an in-house program was to "know more about the school". Many of the teacher educators in Macau have no or very limited experience with a class of that size, or indeed some of the physical limitations Teacher Two mentions. Coming as we often do from an EFL teaching background many of us are more used to classes of no more than 25 students and often with state of the art equipment, moveable chairs – good acoustics and sound limitation which are specifically designed with the communicative language classroom in mind.

Limitations of research

The research described in this paper centred around one Middle school in Macau. As such the results are not generalizable to Macau in general, and perhaps less so to the world beyond Macau. A further limitation was that the researcher and the provider of the teacher education were the same person, which may have influenced the responses provided by the participants, though, as described above, the researcher attempted to minimize this effect. Additionally, as Morrison (2006) describes, Macau's small dimensions do give rise to a "fishbowl" effect, which might make some respondents hesitant about giving honest answers, if they feel they might conflict with the ideas of more powerful people.

Discussion

The majority of the responses to the questionnaires indicate that the teachers on the course thought that the theories presented on the course were best practice and research based. However, while some teachers indicated that they could use activities presented with some adaptation, other respondents felt that there was a large gap between what was useful or productive in theory and what could be applied in their own context. This was either owing to physical factors, class sizes or institutional constraints, including fixed curricula and the need to cover a large amount of content. While some teachers attempted to re-evaluate the structure of their reading skills, for others it was simply a case of adopting a preferred activity or activities.

Despite the sense that some respondents felt that much of the material covered in the course needed great adaptation, or was unsuitable for this context, the majority of questionnaire responses also indicated a positive attitude towards the professional development course.

The interview portion of the data collection provided richer data in answering this question, in fact leading the researcher to speculate whether similar interviews or focus groups should have taken place prior to the teacher education course. A majority view amongst the teachers was that in future teacher education programs the teacher educator should make every attempt at gaining comprehensive context awareness, and materials should be designed with the context firmly in mind. While this was by no means a universal view, it does come through in the questionnaire, and especially interview data.

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Developing Resilience and Life Mastery Skills in the Classroom - A Multiple-Case Study Comparing a Norwegian and a Peruvian Context

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Abstract

Despite different circumstances, something is universal for pupils across the world; they need motivation and resilience to succeed. This is what the current study is about; how to facilitate for increased motivation and development of life mastery skills in the classroom so that puils are resilient when they meet obstacles in their learning and in their lives in general. The study is part of a project called «A Systematic Approach – the fivestep Motivation Method», which started in the southern region of Norway and has spread to new contexts such as Peru. The current study investigates and compares how Norwegian and Peruvian students perceive a fivestep method for working with life mastery and motivation. The study concludes that many students in both groups appreciated the method, but there is a difference. In general, the Peruvian students seemed to benefit more, as the majority there reported that they became better at prioritising and solving problems, and they experienced increased motivation. There is, however, a need for a more thorough study on how the fivestep approach affects students in different contexts.

Keywords: resilience, life mastery, motivation

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Introduction

The background for the project of which this study is part was raising concerns about high drop-out rates and low motivation in Norwegian schools (Skoleporten 2017). As a respond to this, we started an action research project applying a systematic approach for working with motivation and mastering life in upper secondary schools (SAMM)[1], where the students reflect on positive and challenging aspects of their lives (Horverak, Aanensen & Langeland, 2019; Horverak & Aanensen, 2019) The essence of the approach is that students learn to take responsibility for their own lives and their own learning, rather than looking for solutions others may provide. The students' reflections revealed that often, mental problems and learning problems go back all the way through primary school. Therefore, the project was expanded to include lower secondary school and primary school. The focus of the current study is how teachers can facilitate for the development of resilience and life mastery skills in primary and lower secondary school classes, and since these are relevant issues across international contexts, the study includes a comparison of a Norwegian and a Peruvian context.

A national survey in Norway showed that young people in both lower and upper secondary school struggle with mental issues (Bakken, 2018), and the score on feeling of loneliness is higher than ever before. More and more struggle with physical problems as headaches, and there is an increase in sleeping problems and depressive symptoms, A similar survey from 10-12 years old reveal that a majority of around 90% report good health (Løvgren & Svagård, 2019), but that also means that there are quite many children that experience health problems at an early age. There are quite a few children that feel lonely or sad, or have a negative self-image. Children report that they do not have friends, they are bullied, or they feel stressed. Around 20% also report that they have used painkillsers the last week, and they report problems such as head aches, pains in neck or shoulders, stomach ache and nausea. Both surveys revealed that 1 of 5 dread going to school. Another report revealed that mental issues and mental suffering are among the largest public health challenges in Norway (Meld. St. 19, 2018-2019). Between 16 and 22 percent of the adult population in Norway suffers mentally for a period of at least 12 months, and about 7 percent of preschool and school children have symptoms that signal mental suffering. These are alerting signs showing that it is not enough to put in efforts in upper secondary school to prevent drop-out, we need efforts all the way from primary school to support children to develop strategies that help them become motivated, resilient and healthy.

The Norwegian government has the last few years made plans to focus on improving mental health in the population, and now there is a focus on improving children and youths' mental health. The programme Healthpromoting Kindergartens and Schools, of which the current study and the project SAMM is part, is one of the measures taken to improve the situation. Also in Norwegian school curricula, we see this increased focus on health, as public health and life mastery are emphasised as topics that are to be integrated in education. Students are supposed to learn how to master life and influence factors that are of significance in their lives. More specifically, they are to learn how to "handle both success and hard times, and personal and practical challenges in a best possible way" (*Overordnet del*, 2018, 2.5.1. my translation). One

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[1] For more information on the project, see https://samm.uia.no/en/frontpage/

way of meeting this requirement is to implement a systematic approach as presented in the current study.

Reflecting on issues important in life and devoping strategies for taking control of their own learning are also central elements in the Peruvian school curriculum. It states that "the student understands and appreciates the spiritual and religious dimension in the lives of people and societies" (*Currículo Nacional*, 2019, p.17, my translation). This is specified as learning to reflect on the meaning of life, and the ethical and existential commitment in building a more just world. It also includes learning to show respect and tolerance for people's diverse worldviews, religions and beliefs. That students are to take responsibility of their own learning process is also included: "The student develops autonomous learning strategies for the continuous improvement of their learning process and their results" (*Currículo Nacional*, 2019, p.17, my translation). This means that they become aware of learning as an active process, identify advantages and difficulties and organise their learning. Based on this, the systematic approach developed in the project SAMM in the southern region of Norway was implemented also in several groups in Peru through a pilot project to investigate the potential of the fivestep approach here. This is a very different context from the Norwegian context, as Norway is one of the richer countries in the world (GDP per capita in 2018: 81 697 USD, the fourth highest in the world), whereas Peru is a country with much lower living standards (GDP per capita in 2018: 6941 USD) (The World Bank, retrieved 02.01.2020). As much as 21% of the population was below the poverty line in 2017 (United Nations Association of Norway, retrieved 02.01.2020), and the country has received aid from Norway for many years (NORAD, retrieved 02.01.2020).

This background led to the following research questions: *1) Can a systematic approach to teaching life mastery skills in the classroom support students to become more focused, motivated and resilient, and if so, how? 2) Is there a difference between how Norwegian and Peruvian students respond to a systematic approach to working with life mastery and motivation?* To investigate this, the fivestep approach presented in this study was implemented in several groups in both Norway and Peru, in both primary and lower secondary school. The approach applied in this project builds on motivation theory, emphasising intrinsic motivation as crucial for seeking new situations and challenges such as exploring or learning new knowledge (Ryan & Deci, 2000, 2017). Having intrinsic motivation means that one really wants to do something, not just for the sake of others or external rewards, but for the enjoyment of the activity. Ryan and Deci argues that in order to achieve intrinsic motivation, the three basic needs of competence, autonomy and relatedness must be met. This is what we aim for with the fivestep motivation method, meeting these three basic needs so that students feel that they want to learn, that they can master both school and life and that they belong in a group.

The motivation method also builds on Antonovsky's salutogenic model as the aim of the method is to support health and well-being rather than on identifying symptoms of illness and causes of health problems (2012). Antonovsky focuses on the importance of developing resilience, meaning a feeling that it is possible to cope with possible changes and challenges that may occur, and he presents the concept of «sense of coherence». Having a sense of coherence includes three elements: a) one feels that one understands surroundings and events that take place, b) one understands what

resources one has available and believes that one can master possible challenges that may occur, and c) one can see the value of one's own engagment, or one's own contribution when meeting with challenges. He also points out that experiencing a sense of coherence also leads to motivation. Research has shown that children develop resilience if they feel safe, they receive support, they belong to a community and they have relations with adults (Ungar, 2015). When applying the motivation method in classrooms we try to facilitate for creating such an environment, at the same time as teaching a strategy for coping with emotions and challenges in life.

Methodology

This study investigating how a systematic approach to working with life mastery and motivation works in different contexts combines qualitative and quantitative data, all self-reported data from students. After an intervention of four sessions, the participants evaluated the method applied and how it had influenced them. The conclusions in this study are based on the analysis of these evaluations. In the following, the intervention, the measuring instrument and the sample are described in more detail. Some reflections on validity and reliability of the findings are also included.

Intervention

The five steps in the method applied in the teaching intervention are illustrated in figure 1 below. Students discuss and define 1) what is important in life, 2) success factors; what skills they have and what is positive in life and 3) possible obstacles; whether something stops them in life. Then they decide: 4) what to focus on, and 5) how to carry this out.
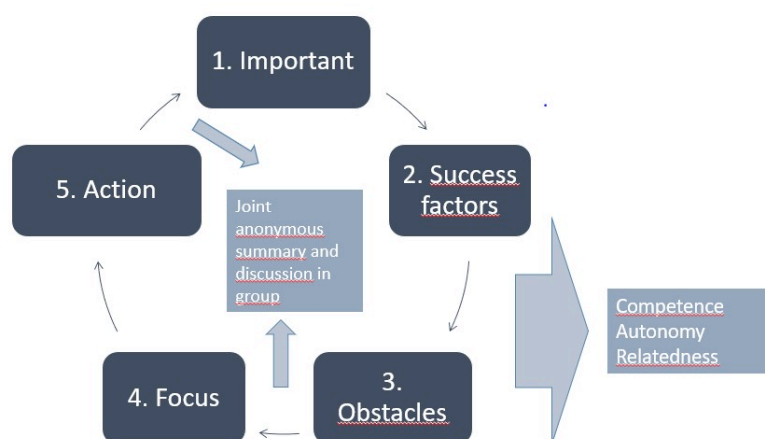
Figure 1. The fivestep approach to working with life mastery and motivation

In the first session of the intervention, questions one, two and three were discussed, and then the students wrote individual answers in log books. They chose a random number for the log book so that everything they wrote was anonymous. The teacher collected the books after the session. In the second session, the teacher summed up the students' reflections, then they discussed how to deal with some of the obstacles mentioned by individuals in the class, or how they could achieve what was important to them. Following this discussion, the students found their log books, and wrote

answers to questions four and five: what they wanted to focus on and what specifically they were to do. The teacher collected the books again, and the third session started with the teacher giving examples of some action plans. The class discussed alternative actions that could be chosen to succeed with the focus area. Then the students found their log books, evaluated whether they had followed their plan from the week before, and wrote a new plan. In session four, this process was repeated.

Measuring instrument

The measuring instrument used was an evaluation form including the following questions: 1) Does the motivation method help you find out what is important to prioritise? (alternatives: yes, no, I do not know) 2) Has the method made you more motivated to work with what is important for you? (alternatives: yes, no, I do not know) 3) Do you now find solutions to obstacles more easily? If yes, explain if you can. (alternatives: yes, no, I do not know) 4) Give examples of something you have focused on working with 5) Have you managed to follow your own plans? (alternatives: yes, partly, no) 6) Has working with the method influenced how you behave towards each other in class? (alternatives: yes, no, I do not know) If yes, explain if you can. 7) How satisfied have you been with the motivation method? (alternatives: not satisfied, a little satisfied, satisfied, very satisfied, I do not know). The students also crossed out whether what they had written could be used for research purposes. The evaluations were anonymous, and have been translated to English from Norwegian and Spanish for this study.

Sample

The sample consists of a total number of 490 informants, including 138 informants from a Norwegian context (response rate 74%) and 352 informants from a Peruvian context (response rate 83%). The Norwegian sample included students from two 6th grade groups (N=24), one 8th grade and six 9th grade groups (N=114), of which some of them were collapsed for the intervention (see table 1).

Table 1. *Norwegian sample.*

School number	School type	Class	Age	Total number of students	Number of informants
1	Prim.	6*	10-11y	31	24
2	Sec.	8.-9.*	12-14y	11	9
3	Sec.	9a	13-14y	29	21
3	Sec.	9b	13-14y	28	18
4	Sec.	9a	13-14y	29	22
4	Sec.	9b	13-14y	30	25
5	Sec.	9	13-14y	25	19
Total:		**7**		**183**	**138**

Note. *Two groups were collapsed during the intervention.

The Peruvian sample included students from one 6th grade (N=26) and 14 secondary school groups (N=326): four 1st year groups, three 2nd year groups, two 3rd year groups, two 4th year groups and three 5th year groups (see table 2 below).

Table 2. *Peruvian sample*

School number	School type	Class	Age	Total number of students	Number of informants
1	Prim	6	11-12y	28	26
2	Sec.	1	12-13y	35	27
2	Sec.	2	13-14y	35	31
3	Sec.	1	12-13y	20	12
3	Sec.	5	16-17y	25	20
4	Sec.	1a	12-13y	28	27
4	Sec.	1b	12-13y	30	27
4	Sec.	2a	13-14y	29	28
4	Sec.	2b	13-14y	29	22
4	Sec.	3a	14-15y	30	26
4	Sec.	3b	14-15y	24	20
4	Sec.	4a	15-16y	27	27
4	Sec.	4b	15-16y	29	20
4	Sec.	5a	16-17y	26	12
4	Sec.	5b	16-17y	27	27
Total:		**15**		**422**	**352**

In Norway, one primary school and four lower secondary schools participated. The age range of students in lower secondary schools in Norway is from 12 to 15. In Peru, one primary school and three secondary schools participated. The age range of students in secondary schools in Peru is from 11 to 17 years. Hence, the sample from the two contexts differs somewhat in age range.

Reliability and validity

Whether the method applied in this study actually supports students to master life could be measured in different ways, but as this is a pilot project, the research design has been kept simple. The students filled in an evaluation form that included a limited number of questions and alternative answers, hence, all the data is self-reported. In order to generalise from the findings, more research is needed. Another challenge with the study is that some students may experience what is called the Hawthorne effect (Ary, Jacobs, Irvine & Walker, 2018), that they change behaviour due to participating in research. This is perhaps more likely in a Peruvian context, as quite many research studies and other types of projects are conducted in Norwegian schools. To meet these challenges, the evaluation form used includes questions that urge students to reflect on a possible change they experience. What the students wrote supports the fact that they have really experienced a change.

Results

To investigate how a systematic approach to working with life mastery and motivation influenced students in both a Norwegian and a Peruvian context, the students' anwers to the evaluation form are presented in bar charts. The results are supported by examples from the students' reflections. To the question of whether the motivation method helped them find out what was important to prioritise, the majority

of the Peruvian students answered positively, 85% in secondary school and 81% in primary school, whereas about half of the Norwegian students confirmed that it did, 44% in lower secondary school and 50% in primary school (figure 2).
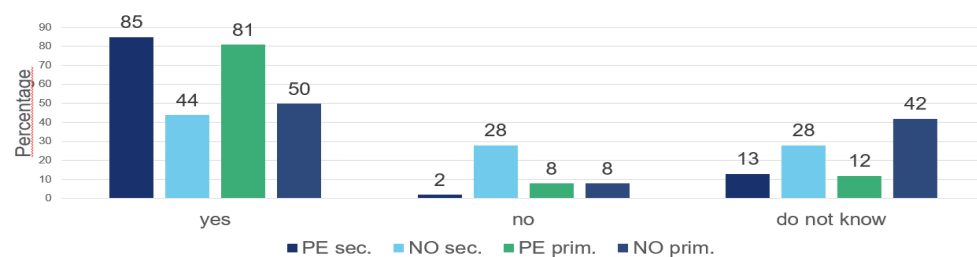
Figure 2. Answers in percentages to the question: Does the motivation method help you find out what is important to prioritise?

To the question of whether the method had made them more motivated to work with what was important to them, we see a similar pattern (figure 3).
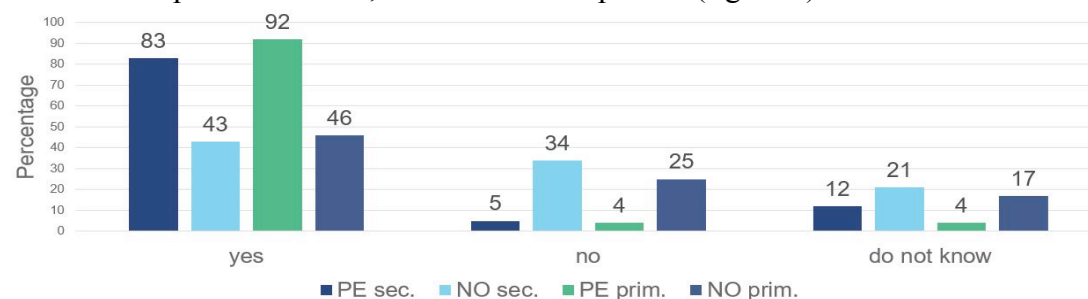
Figure 3. Answers in percentages to the question: Has the method made you more motivated to work with what is important to you?

The majority of the Peruvian students answered positively, 85% in secondary school and 92% in primary school, whereas somewhat less than half of the Norwegian students confirmed that it did, 43% in lower secondary school and 46% in primary school. On the question whether they found solutions to obstacles easier now (figure 4), 69% of the Peruvian secondary school students answered positively and 65% of the primary school students, whereas in a Norwegian context, only 29% of the secondary school students and 21% of the primary school students answered yes.
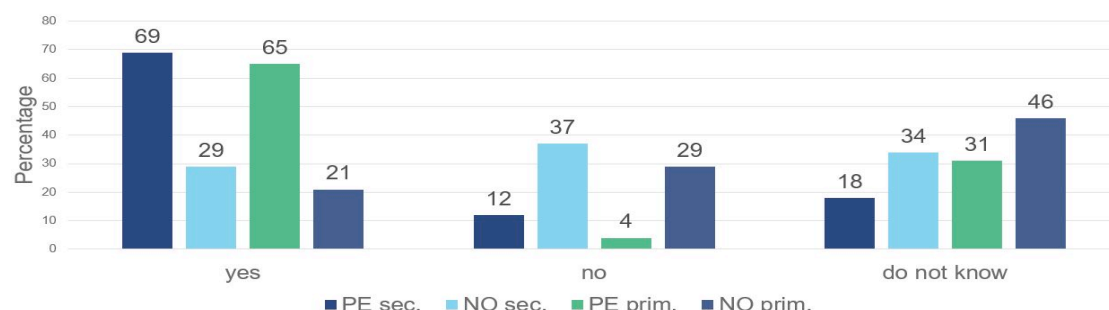
Figure 4. Answers in percentages to the question: Do you easier find solutions to problems now?

Few of the Norwegian students explained how this had changed, but one of them answered «one manages to take time to think» (9th grade). In the Peruvian sample,

there were many reflections on this change, and some of the answers given by secondary school students were: «By talking about it» (year 1), «Because we have a plan that helps us do what we want» (year 1), «I try to look for possible solutions and what may be possible consequences» (year 1), «By trying to see things from another angle, I can see better solutions than before when I only saw them from one side» (year 1), «I do not give up so easily» (year 1), «It helps me see my strengths and weaknesses and remember that in spite of everything, there are important things that makes me progress» (year 3), «Yes, I changed my weaknesses and became more responsible» (year 3), «When I know what my problems are, I can find solutions quickly» (year 4). There were many similar answers in the Peruvian data that stated that they had improved their ability to find solutions to problems, and that learning the fivestep method helped them become more capable of dealing with challenges.

When asked about what they chose to focus on, there were many similar answers in the two different samples. Both focused on school, either improving in subjects or doing more homework, but there is more focus on improving in particular subjects in the Peruvian sample than in the Norwegian. Mathematics is the subject mentioned by most, but only 7 students in the Norwegian sample mentioned it, whereas 68 students in the Peruvian sample mentioned it. In the Norwegian sample, many students wrote that they were to focus on friends, family and sparetime activites, and getting more sleep. In the Peruvian sample there was more focus on family than friends. Generally, to get along well and build good relationships was in focus in more of the answers, as we see in the following examples from secondary school: «One example is that I have tried to live more in harmony with my parents and siblings, and support each other» (year 1), «I focus on talking together and coming to an agreement, to talk without beating» (year 1), «To keep calm in stressful moments and avoid letting ager and frustration affect others» «year 4). We see here a somewhat serious tone relating to controlling emotions that there was no parallel to in the Norwegian data.

When asked about whether they managed to follow their plans, 54% of the Peruvian secondary school students and 77% of the primary school students answered positively, whereas 33% of the Norwegian secondary school students and 50% of the primary school students answered yes (figure 5).
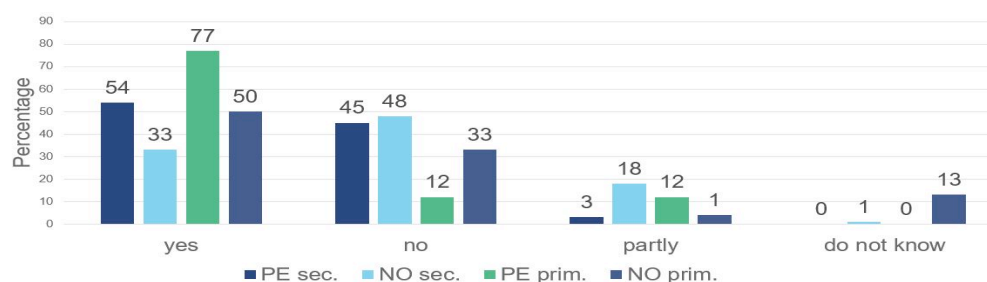
Figure 5. Answers in percentages to the question: Have you managed to follow your own plans?

However, 18% of the Norwegian secondary school students answered that they partly followed their plans, and only 3% of the Peruvian secondary school students, so when added 57% of the Peruvian students followed their plans at least partly, and 51% of the Norwegian students. This shows that there is not much difference between the two contexts here.

On the question of whether working with the fivestep method had affected how they behaved towards each other in class, more than half of the Peruvian sample answered positively, 54% in secondary school and 62% in primary school, whereas fewer students in the Norwegian sample answere yes, 17% in secondary school and 21% in primary school (figure 6).
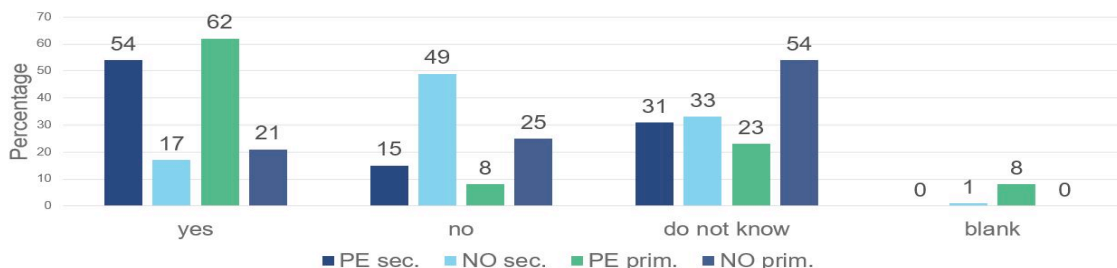
Figure 6. Answers in percentages to the question: Has working with the method affected how you behave towards each other in class?

There were little reflections on this change in the Norwegian data, but one of the 9th grade students wrote: «I cannot really explain, but…». The Peruvian data revealed that not everybody had understood the question correctly, as their answers rather reflected a change on an individual level. Some of the Peruvian secondary school students did, however, reflect on how the environment in the class had changed, or how their behaviour in class had changed: «I am more supportive towards my peers» (year 1), «Yes, because we respect each other» (year 3), «In the classroom, we are more independent and capable of solving problems» (year 4).

When evaluating how satisfied they were with the method, a majority of the total sample answered positively (figure 7).
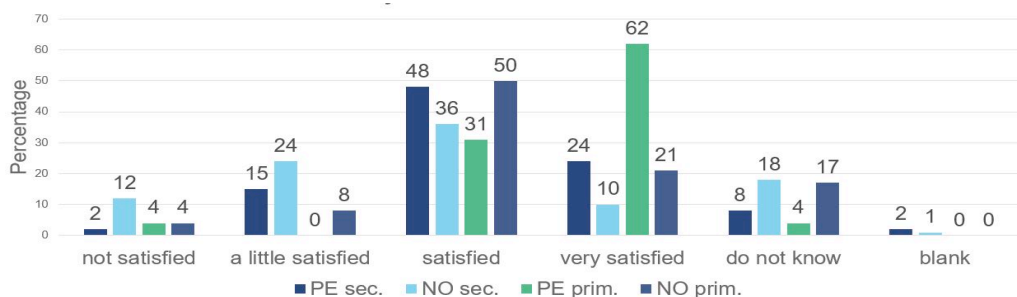
Figure 7. Answers in percentages to the question: How satisfied have you been with the motivation method?

Of the Peruvian sample, 62% of the primary school students were very satisfied, and 31% satisfied, and only 4% were not satisfied. A total of 93%of the Peruvian primary school students expressed satisfaction with the method. In the Peruvian secondary schools, 24% were very satisfied, 48% satisfied, 15% a little satisfied, and only 2% were not satisfied. In total, 87% of the Peruvian secondary school students expressed satisfaction with the method. In the Norwegian sample, 21% of the primary school students were very satisfied, 50% were satisfied, 8% were a little satisfied, and only 4% were not satisfied. A total of 79% of the Norwegian primary school students were satisfied with the method. Of the secondary school students, 10% were very satisfied,

36% were satisfied, 24% were a little satisfied and 12% were not satisfied. In total, 70% of the Norwegian lower secondary schol students were satisfied to a certain degree.

Discussion

To sum up the results of this study, many students express satisfaction with the systematic approach applied in this project to facilitate for developing resilience and life mastery skills. However, it seems to like the Peruvian students appreciate it more than the Norwegian students. Still, quite many students, both Norwegian and Peruvian express that they have become better at prioritising, more motivated and better at finding solutions. From the students' more open reflections, we see that the Peruvian students focused more on school subjects and serious issues, so this may have affected to what extent they appreciated the method applied. That the Peruvian students seem to have taken this work more seriously could also be related to the fact that they have tougher living conditions than Norwegian students, and have a greater need for a method that can help them build resilience and experience a sense of coherence (Antonovsky, 2012).

An important aspect in the fivestep method is the inclusion of discussions in the classroom, and creating a safe atmosphere. As stated in research, children need to feel safe and supported in order to develop resilience, and relations with adults is also important (Ungar, 2015). Not all problems can be solved by a child, and perhaps being given this type of channel to write to an adult what is difficult is exactly what children need. In some cases, the teachers had to follow up on serious problems that appeared in the reflections by finding out who had written this and making sure they were followed up and had somebody who could help them. This could be a challenge in large groups with several individuals who struggle, but still, the anonymity is perhaps what makes them confide in the teacher in the first place.

Even though quite few students reported an effect on how the individuals in the class behaved towards each other, the students may have increased their feeling of relatedness just because the teachers chose to apply this approach. Perhaps there also was some kind of change in the class that was difficult to pinpoint. As one of the Norwegian students said, «I cannot really explain, but…». This indicates that there has been a change, but it is difficult to describe it with words. Perhaps bringing the topic of life mastery into class and discussing difficult issues was what helped the students rather than following the steps in the method. Regardless of what element of the method helped the students, the results in this study shows that this is an approach worthy of further investigation.

Conclusion

This study concludes that a systematic approach to teaching life mastery skills in the classroom may support students to become more focused, motivated and resilient. As some of the students report, applying the method helped them identify their problems, consider different solutions and make plans for how to progress. There is a difference between how the Norwegian and the Peruvian students responded to the approach. Many students in both groups reported positively to how the method affected them, but the Peruvian students showed a greater appreciation than the Norwegian students

did. Perhaps this implies that the approach is more beneficial in some contexts, perhaps in contexts where the students struggle more, but this is an aspect that needs further investigation before any conclusions can be drawn. It is a limitation that the study relies only on self-reported data, but the students' reflections show that something changed as a result of working with the fivestep method. Further studies are needed to investigate what type of effect this approach has on students, and there is a need to look at how it actually affects the learning environment. Another relevant issue that needs to be discussed more and investigated further is to what extent children can be made responsible for changing their own lives and surroundings.

Acknowledgements

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Culture Adaptation and Employment Situation
-The Case of Foreign Students in Japan-

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Abstract
Several researches have been conducted to identify factors related to intercultural adjustment. Life across borders needs cross-cultural coping abilities. Evidences from empirical and theoretical research indicate several factors that influence the cross-cultural adaptation process in culturally diverse environment. The continued increase in the number of international students has caused a corresponding increase in a variety of problems and challenges regarding overseas study (Gebhard, 2012). For the last few decades, Japan has been one of the favorite destinations for international students. The increase in the country's foreign student population calls for a system of support that can sustain the emotional and psychological adjustment to the host country. The problem of adjustment, particularly in the tertiary level is of gigantic importance, in order for foreign to achieve their intellectual pursuits. What are the culture adjustment behavior patterns of international students? What major problems confront them, and how do they cope? Do male students adjust better and/or faster compared to female students? This study uses two assessment scale the Index of Life Stress (ILS) and Index of Social Support (ISS) to measure the degree of life stress and social support (Ikeguchi, 2007) available to two groups, the male and female groups. ILS measures four areas of stress, and ISS attempts to measure the degree of four types of social support available to foreign students in Japan. The paper also deals with a second issue. How many foreign students who graduate from Japanese universities choose to work and live in Japan? The truth is that most of the foreign students continue to work in Japan after graduation. But how many female students get a job in Japan after graduation? This paper aims to explore the labor participation of foreign born graduates in Japanese universities.

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Introduction

This paper is part of a series of investigations on the relation between adjustment issues and coping mechanism across different populations in the area of intercultural adaptation. The first survey was conducted on two groups of foreigners working in Japan: the skilled and the unskilled workers (Ikeguchi, 2007). The second survey was conducted on foreign students in the country in relation to gender and employment after graduation (Ikeguchi, 2019). The current investigation is an attempt to validate the previous surveys by adding more respondents to the questionnaire. On the theoretical side it aims to explore the adjustment situation of international students in the country. On the practical side, it aims to highlight the employment situation of international students in relation to gender issues. Do these issues relate? What is the connection? The aim is to find an intersecting point(s) to validate data on intercultural adaptation of foreigners in the country.

Intercultural Adjustment of working group

Several attempts have been conducted to identify factors that influence intercultural adjustment (Ward & Kennedy, 1999). Measures have been developed to assess constructs that both theoretically and empirically link to intercultural adjustment (Matsumoto, 2003).

The number of foreigners living in Japan, either on a short or long term basis, has dramatically increased since the turn of the 20th century. By 2006, the number is at its record high in the history of the country's international human exchange.
In the first investigation, Ikeguchi (2007) reports:

> *Of the legally visiting foreigners, 38.8% have permanent visas while38.2% hold temporary visas. At the same time, the number of illegal or overstaying foreigners continues to increase and yet is left unaccounted for. These individuals, who actually form the backbone of the country'seconomy, choose to overstay and do the country's dirty, difficult and dangerous jobs.*

The increase in the country's foreign population calls for a system of support that can sustain the emotional and psychological adjustment to the host country. To say the least, very few academic investigations have been conducted on the patterns of foreigner adjustment in Japan. The first part of this research used a set of indexes that measure life stress and social support adapted from Yang and Clum (1995).

The Index of Life Stress (ILS) measured six areas of life stressors: language, work/career concerns, financial concern, interpersonal relationship, future concerns and overall culture adjustment concerns. The Index of Social Support (ISS) assessed four areas from which the respondents draw some kind of social support: contact with family, friends, and contact with members of the host country and support from one's religion.

The respondents were asked to rate their agreement with the statements using a Likert Scale and data obtained were analyzed using principal component method and factor analysis. The findings on Life Stress and Social Support for the two groups are summarized in Tables 1 & 2 and Tables 3 & 4, respectively.

ILS Results for the 1st and 2nd survey (Construct validity & factor analysis)

Constructs under investigation	
1. Language difficulties	.70
2. Interpersonal stress	.68
3. Culture adjustment-related stress	.60
4. Future-related goals	.65
5. Work-related goals	.56

Table 1. Results for skilled workers (significant scores highlighted)

Constructs under investigation	
1. Language difficulties	.67
2. Interpersonal stress	.49
3. Culture adjustment-related stress	.56
4. Future-related goals	.64
5. Work-related goals	.51

Table 2 Results for unskilled workers (significant scores highlighted)

The results indicate that the second group (unskilled workers) report higher levels of stress compared to the first group. At the same time, lower mean scores in the ISS of the "laborer" group indicate lower levels of social support compared to their counterpart.

ISS Results for the 1st & 2nd study

Constructs under investigation	
1. Contact with one's culture	.67
2. Contact with friends	.77
3. Contact with members of host culture	.59
4. Contact with one's religion	.39

Table 3 Results for skilled workers (significant scores highlighted)

Constructs under investigation	
1. Contact with one's culture	.57
2. Contact with friends	.47
3. Contact with members of host culture	.21
4. Contact with one's religion	.51

Table 4 Results for unskilled workers (significant scores highlighted)

Intercultural adjustment of foreign students

While the first part of the investigation documented a significant difference in life satisfaction between labor workers and professional groups in Japan, it also highlights the importance of personal and situational factors and the interaction of at least three variables: language fluency, work expectations, and host interactions.

For the last few decades, Japan has been one of the favorite destinations for international students. Japanese universities are racing to attract international students to raise competitiveness among their ranks, as well as their global counterparts. Tsukuba University, for instance, reports that students from overseas find many good reasons to study in Japan. While some are attracted by Japan's high educational standards, others choose the country for its rich cultural heritage. The government is also taking steps to achieve this goal. The government has set on course to reach its goal set almost a decade ago to attract some 300,000 foreign students in higher education. As the accompanying graph indicates, the total number of international students has climbed sharply since 2011. JASSO reports that by 2017, the number of international students during the fiscal year 2017 is 336,320.
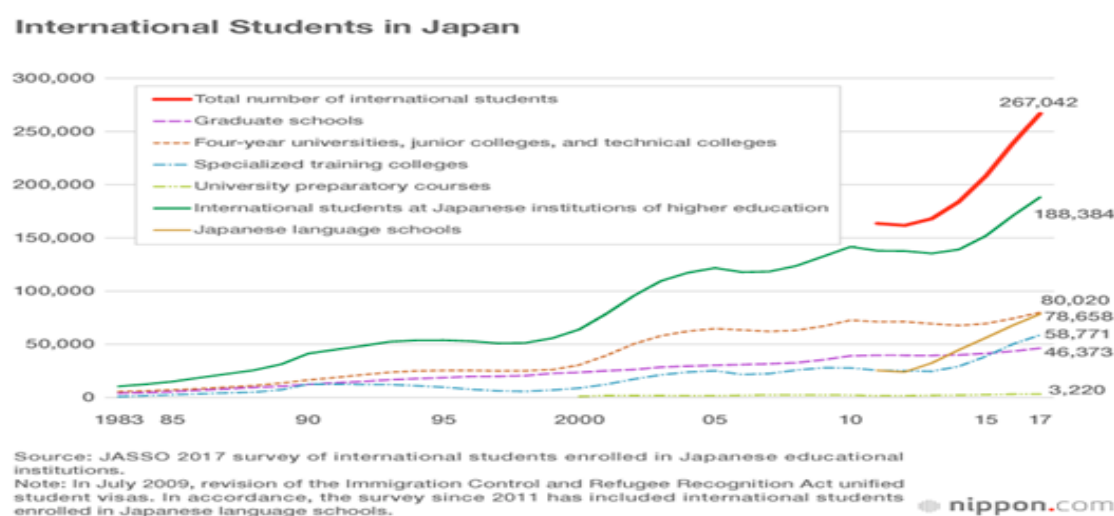
Figure 1 International students enrolled in Japanese educational institutions

The unprecedented rise of international students in the country calls for a system of support that can sustain their emotional and psychological adjustment to the host country. Given the present condition, while prediction of culture adjustment of international students is imperative, few studies have addressed this issue. (Yang & Clum, 1995). Findings of previous research suggest four major challenges: personal psychological issues such as stress, anxiety and loneliness, general living issues such as financial stress, sociocultural issues, and language issues (Lee, 2017). Earlier, Gebhard (2012) looked into the kinds of adjustment problems and adjustment behavior of international students while studying in the United States. Gebhard pointed out challenges related to academics, social interaction, and emotions. The study also indicated that students use coping behaviors that help them meet these challenges, such as using reminders of home culture, talking with friends, and using humor.

As the second part of an exploratory research, the present study aims to continue on with the theme of intercultural adjustment focusing on international students. The aim is to find out life stressors and coping mechanism foreign students use while studying in Japan. The same set of instruments: the Index of Life Stress (ILS) and Index of Social Support (ISS) were used and a questionnaire was administered to a group of international students. Considering the specific life situations that confront foreign students however, the instruments (ILS & ISS) were re-adjusted and tailored to suit the needs of the student population.

The situation of international students in Japan is unique in a sense because the country offers greater opportunities after graduation. There is a strong job market for highly qualified graduates. In a recent survey, around half of the major Japanese companies surveyed expressed a desire to hire foreigners graduating from Japanese institutions. Hence, besides inter-cultural adjustment, the present study aims to explore the employment situation of international students in relation to gender issues.

The Index of Life Stress (ILS)
The Index of Life Stress consists of questions to which students report their agreement.
1. Japanese language is difficult.
2. Japanese people are hard to understand.
3. I find it hard to adjust to Japanese culture.
4. I am uncertain about my life after graduation.

The Index of Social Support (ISS)
The Index of Social Support, aimed to explore life stressors, consists of questions as follows.
1. I have contact with students of same country
2. I have contact with students from Japan
3. I have contact with international friends
4.   I have contact with Japanese friends

Responses were scaled on 5 levels of the Likert Scale.
* 5 = strongly agree 4= agree 3= uncertain 2= disagree 1= strongly disagree

The survey was conducted twice. The first was in 2018 using 20 students and the results were reported in SIETAR 2019. Given the limited respondents, it was deemed necessary to validate the results. Hence a second survey was conducted thereafter adding a few more respondents. The results of the 1st and 2nd survey are summarized below.

Results of Life Stress and Social Support

Life Stress Indicators (N=20)			Social Support (N=20)		
	M	F		M	F
Language concern	3.5	4.1	Same country Ss	**4.0**	**3.8**
Interpersonal	3.6	3.9	Ss from Japan	2.5	2.8
Culture adjustment	2.8	3.3	International friends	2.9	2.9
Future goals	**4.1**	**4.2**	Japanese friends	3.2	3.5
Mean analysis	3.5	3.8			
Significant at	P<.001	P<.002		P<.005	P<.001

Table 5. Results for 1st group of students (significant scores highlighted)

Table 5 indicates that the most major concern of international students was future

goals. For both male and female population, employment after graduation was a major concern. This was supported by high significant results. With regard to source of social support, both groups of respondents (M & F) report overwhelmingly that interaction with students from the same country is an important source of social support. The results seem to reiterate the need for a more inter-cultural mix between international and local students both in school, in the classroom, and outside.

Life Stress Indicators (N=20) (N=30)			Social Support (N=20) (N=30)		
	M	F		M	F
Language concern	3.5	4.1	Same country students	4.0 4.2	3.8 4.5
Interpersonal	3.6	3.9	Students from Japan	2.5	2.8
Culture adjustment	2.8	3.3	International friends	2.8	2.9
Future goals	4.1 4.5	4.2 4.8	Japanese friends	3.2	3.5
Mean analysis	3.51	3.8		3.12	3.25
Significant at	P<.001	P<.002		P<.005	P<.001

Table 6. Results for 1st and 2nd group of students (significant scores highlighted)

Given the limited samples in the 1st survey, it was necessary to conduct the survey adding a few more respondents. Table 6 summarizes the findings for the 1st and 2nd groups of samples. Results indicate that future goal remains to be a major concern for all respondents in the survey, both male and female. With regard to social support, both groups of international students surveyed seem to draw their social support from interaction with students from the same country.

Employment situation of international students

The next task is to explore the employment situation of international students in Japan. This paper hopes to answer the following questions. How many international students choose to stay in Japan after graduation? Is the labor market really open to foreigners who graduate from Japanese universities? Is the situation the same for both male and female international students?

What do international students do after graduating from Japanese schools?
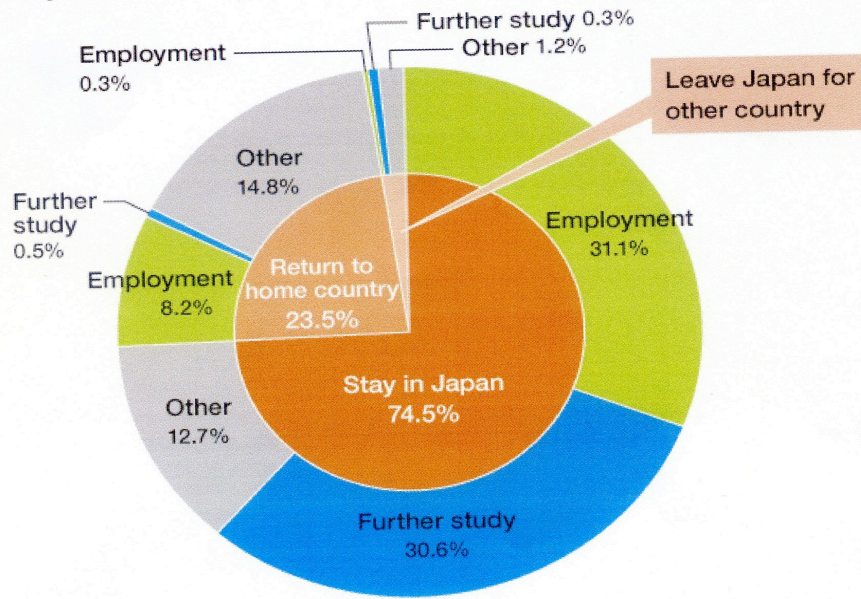
Figure 2 International Students after Graduating from Japanese Schools

The data above shows that majority of students choose to stay in the country after graduating from Japanese educational institutions. About half of the number of those who stay work in Japan while others continue with further studies. The next question this paper aims to answer is: What is the employment situation of those who choose to stay in Japan? What are the employment opportunities for international students?

Is the situation the same for male and female students?
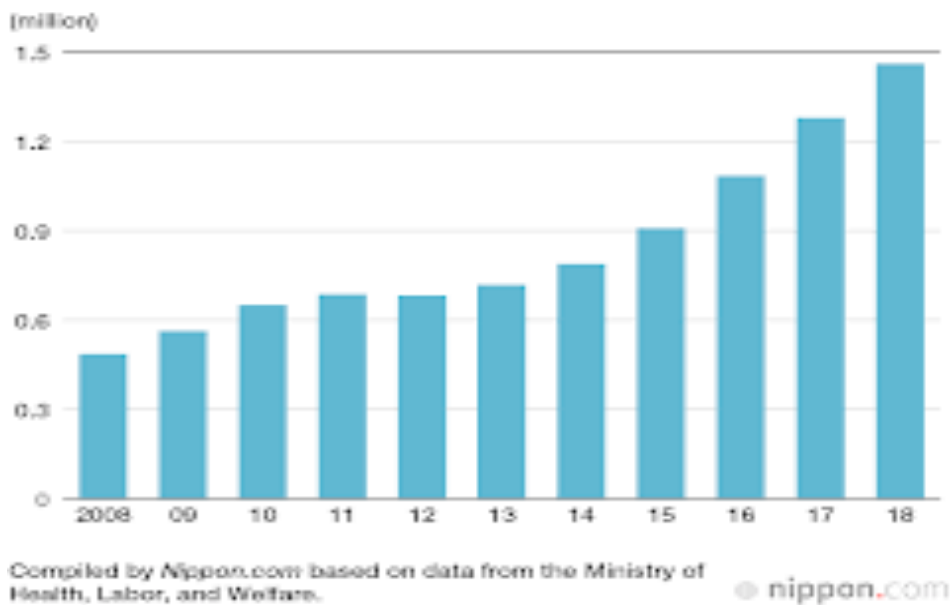
Figure 3 Foreign Workers in Japan

The first task was to find out the population of foreign workers in Japan. Fig 3 above shows the trend in the dramatic increase of foreign workers in the country, based on the data of the Ministry of Health. Labor and Welfare as of 2018. A lot of periodic data have been published by different Ministries of the government regarding the distribution of skilled and unskilled workers in the labor market. Unfortunately, there seems to be a dearth of data related to this research that aims to explore the situation on student employment. The information such as that shown in Table 7 below provides the closest link to this investigation.

AGE	2000				2010			
	TOTAL	Labor force			TOTAL	Labor force		
		Total	Employed	%		Total	Employed	%
MALE	(1,000 persons)							
15 & over	543	419	395	77	618	423	385	68
15-19	34	11	10	32	30	6	5	21
20-24	63	44	41	69	85	48	45	56
25-29	83	67	63	79	98	67	62	68
30-34	82	70	66	84	84	64	60	75
35-39	71	63	60	88	70	55	51	79
40-44	51	46	44	90	60	48	44	80
45-49	42	38	36	90	50	41	37	82
50-54	36	32	30	88	37	30	27	82
55-59	26	22	21	85	31	25	22	81
60-64	18	13	12	72	26	19	17	73
65 & over	36	14	11	38	47	19	16	39
	1,091			74	1,236			67
FEMALE	(1,000 persons)							
15 & over	614	307	290	50	797	406	374	50
15-19	34	10	9	29	32	8	7	25
20-24	74	47	44	63	108	62	59	57
25-29	99	54	51	54	114	62	58	54
30-34	92	48	46	47	107	57	53	53
35-39	81	40	38	49	97	51	47	53
40-44	57	32	30	55	91	51	46	55
45-49	44	26	25	58	71	41	37	57
50-54	34	20	19	59	50	28	26	56
55-59	26	14	13	54	37	20	18	53
60-64	20	8	8	41	28	13	12	46
64 & over	43	8	7	17	62	12	11	19
	1,218			48	1,594			49

Population Census of Japan. Statistics Bureau, Ministry of Internal Affairs

Table 7. Labor force distribution of foreigners by age and gender

What can be surmised from the report is that data is updated and published in 10 years. We suspect the next update will be published within this year. For the meantime, it is interesting to note from Fig 3 below that male international students continue to outgrow female students.

5. Number of International Students by Gender

(Unit: person)

Gender	Number of students		% of total	
Male	167,269	(149,920)	55.9%	(56.1)
Female	131,711	(117,122)	44.1%	(43.9)
Total	298,980	(267,042)	100.0%	(100.0)

(   ) indicates figures as of May 1, 2017

Figure 3 Gender distribution of international students

Drivers of an Aging Society

1. Employment of Foreign Students in Japan

The participation of foreign students in the Japanese labor market has to be understood against the social, economic and political background the country has undergone for the past several decades.

At the turn of the 21st century, the Ministry of Health, Labor and Welfare addressed the issues of foreign workers in Japan (Yamada, 2010). In his paper "The Current Issues of Foreign Workers in Japan" Yamada reports that on Dec. 30, 2009, the government released its decision to address the issue of population decline and its impact on the labor market. The low birthrate and an aging population were expected to weaken the potential output of Japan's growth engine. Thus, the New Growth Strategy is part of the government effort to cope with this crisis by expanding the right of foreign nationals to participate in the labor market, and encouraging active support and acceptance of international students in specialized fields. For several decades since then, the number of international students who want to work in Japan after graduation has steadily increased. At the same time, many companies had expressed desire to hire students with international experience.

In 2018 Japan opened up a wider path to residency *status* for *international students* allowing them to **work** in any related field of their specialization. The policy allowed foreign graduates to gain wider job options after graduating from Japanese school. Consequentially, the number of foreign students who changed their visa status in 2018 to work in the country after graduation hit a record high. According to the Immigration Services Agency, a total of 25,942 students switched their status of residence. The figure more than doubled from 2013, apparently reflecting an overall growth in the number of overseas students. The overall growth of foreign workers mirrors the surging demand from companies for foreign workers to deal with a labor crunch caused by Japan's aging population. Unfortunately, these raw figures do not provide hints as to what percentage of foreign graduates join the labor market. More importantly, it is not clear what these figures mean in terms of gender differences in labor participation after graduation.

2. Female foreign graduates in the labor market

Gender inequality is greater in Japan than in other developed countries (Abe, 2016). The labor situation of female foreign students need to be examined in the background of the following issues: the "Abenomics" policy, the "Womenomics" Policy, the changing women's outlook on work and family both in the local and international context.

In response to the demographic and social changes, the country has implemented steps towards improving female employment. In his speech to the United Nations in 2014, Prime Minister Abe addressed the issue on women labor situation in Japan. He reiterated that "Japan will create a society where women can shine and show their potential. This economic policy of the government is widely known as "Abenomics". The greatest structural issue facing Japanese economy is the aging population and the shrinking population. On this Japan is committed to achieving sustainable growth and

becoming a pioneer in the establishment of a new social model.

In 2015, Prime Minister Abe stated in the World Assembly for Women in Tokyo that "Abenomics is Womenomics". The aim was to give way to 530,000 women in the workplace by 2014. In August of the same year, the Japanese diet enacted a new law "An Act for the Promotion of Women's Participation and Advancement".

The following year, a law was passed mandating private and government organizationto allocate a certain number of top positions (managerial and administrative) to women.   Inui (2015) made a study on female labor supply and its relation to the recent high unemployment rate in Japan. Inui developed a model that attempts to understand issues of productivity growth and female labor market participation behavior in Japan compared to other developed countries. The study concludes that these laws are important in creating employment and professional advancement of opportunities for women to fully exploit their skills in the labor market.

Summary and Conclusion

This research sheds light on the seriousness of the demographic situation in Japan. It has shown the national efforts and new laws developed to cope with the problems. This research has shown that although there is sufficient data on the increasing number of foreign students in Japan there is a gap on the number of those who join the labor market. In particular, there is a need for data collection that reflect gender differences in labor participation of foreign graduates.

With regard to the initial question posed at the onset of this study: what is the relation between culture adjustment and employment in Japan? There is an increased need to collect sufficient data on the emotional and psychological well-being of the increasing number of foreign students who choose to study and work in Japan after graduation. It has become imperative to define and refine measures that assess different aspects of adjustment according to the nature of stay in the country. For instance, difficulties with the language, as well as lack of contact with the host culture, have been shown to be an important source of anxiety. For a future task, a refinement of the measures used in the study is necessary to assist further in the prediction of successful cultural adjustment. For this to be done, assessment scales can be further validated against existing ones, or new measures can be developed. For instance, incremental validity and regression analyses of the two measures can be applied with other scales such as the Life Experience Scale (LES), Self-Rating Depressions Scale (ZDS), Hopelessness Scale (BHS), and the like. Empirical and field studies have implications for helping foreign nationals improve their adjustment during their stay in Japan. To this end, both empirical and field studies have to be conducted to establish between both the theories on culture adjustment across different foreign population groups and the realities of employment of international students in the country.

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Learning Ecologies: From Past Generations to Current Higher Education

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Abstract
This paper reports on the ongoing establishment of a basis for a re-consideration of the way the contributions to knowledge, culture and social fabric of aging Portuguese scholars may be recognized, communicated and activated in future contexts. The project stems from an analysis of the professional life and work of Portuguese scholars graduated at the School of Fine Arts of Porto (ESBAP), during the 1960s and 1970s, a period marked by the country's political Revolution of April 25, 1974, with deep socio-cultural repercussions. The analysis was performed following semi-structured interviews carried out with informants who attended the School to later become professors. Their testimonies reveal a contrast in learning from being a student and being a lecturer; they provide valuable insights into their personal creative journeys in light of their commitment to education and how their efforts have helped maintain related formal and tacit streams of traditional knowledge, within rapidly changing cultural and socio-political environments.

Keywords: School of Fine Arts of Porto; Wisdom Transfer; Life stories, Art and Design pedagogies

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Introduction

This paper reports on a set of preliminary results of the project *Wisdom Transfer: towards the scientific inscription of individual legacies in contexts of retirement from art and design higher education and research* (POCI-01-0145-FEDER-029038), which arises from the evidence that there is insufficient inscription and use of individual knowledge and experience of ageing and retired art and design professors and researchers. The study is focused on the analysis of the professional life and work of Portuguese scholars, researchers and artists, graduated from the School of Fine Arts of Porto (ESBAP), during the 1960s and 1970s, a period surrounding the social, cultural and political Revolution of April 25, 1974. The pre-Revolution period was characterized by the dictatorship regime and the closure of the country, with scarce foreign influences, including in the artistic scene. Access to artistic materials was very limited and the few accessible resources were of poor quality.

This period was especially notable in ESBAP, not only for the pedagogical practices adopted that differentiated this school from other similar ones, attracting art students from all over the country, but also for the political and social scenario that was lived in the country that resulted in the Revolution of April 25, 1974, which led to Educational reforms and, in the case of ESBAP, the emergence of design as a course.

Since art and design research has only recently been validated as a scientific discipline, we can argue that the available scientific heritage precedes the formalization of these disciplines, residing in an older generation of scholars, researchers and artists. This study aims to establish a basis for a transformation in the way their contributions to knowledge, culture and social fabric are recognized, communicated and activated in future contexts.

In the first part, a sum up of the main characteristics of ESBAP in the pre-revolutionary period is made, pointing out teaching methodologies that proved to be more significant for students at the time. This is followed by an analysis of the first experiments carried out in the school in the field of graphic arts, which would later result in the creation of a design course. Finally, aiming the inscription of the contributions provided by the retired artists, professors and researchers interviewed and the transfer of transgenerational knowledge, a set of initiatives that have been carried out mainly with art and design students is presented.

Methodology

Due to the lack of documentation in this context, the contributions were mostly obtained through ethnographic interviews carried out with informants who attended the ESBAP during the 1960s and 1970s. From December 2018 to December 2019 we have done 32 interviews to former students divided mostly across the disciplines of sculpting and painting, alongside the current director of the Faculty of Fine Arts, University of Porto (former ESBAP), who was considered a person of interest, not only because she is the current director of this school but mainly for her studies on artists graduated from ESBAP (Table 1). The lack of individuals with a formation in design is due to the fact that the design course commenced after April 25, 1974, and its graduating batch falls outside the scope of the project's intended timeframe.

Name	Course	Start	End	Date of the interview
Ana Campos	Communication Design / Graphic Arts	1976	1981	27th June 2019
Antero Pinto	Communication Design	1979	1987	10th January 2019
António Mendanha	Painting	1979	1986	10th January 2019
António Quadros Ferreira	Painting	1966	1971	12th April 2019
Armando Alves	Painting	1957	1962	5th December 2018
Carlos Barreira	Sculpture	1968	1973	8th January 2019
Carlos Carreiro	Painting	1967	1972	16th January 2019
Carlos Marques	Sculpture	1967	1975	11th December 2018
Elvira Leite	Painting	1957	1962	15th January 2019
Graça Morais	Painting	1966	1971	31st January 2019
Haydée De=Francesco	Sculpture	1956	1961	21st January 2019
Helena Abreu e Lima	Painting	1963	1968	23rd January 2019
Helena Almeida Santos	Painting	1961	1966	7th January 2019
Isabel Cabral	Painting	1967	1973	28th December 2018
João Machado	Sculpture	1963	1968	1st March 2019
João Nunes	Communication Design / Graphic Arts	1976	1981	26th February 2019
Jorge Pinheiro	Painting	1955	1963	16th April 2019
José Paiva	Painting	1968	1986	19th December 2018
Leonilde Santos	Painting	1981	1986	14th December 2018
Lima de Carvalho	Painting	1967	1972	31st January 2019
Lúcia Matos	–	–	–	24th January 2019
Manuela Bronze	Painting	1975	1981	4th January 2019
Maria José Aguiar	Painting	1967	1972	14th January 2019
Maria José Valente	Painting	1968	1977	22nd January 2019
Mário Américo	Painting	1962	1972	25th January 2019
Mário Moura	Architecture	1961	1967	5th November 2019
Paula Soares	Painting	1973	1978	8th April 2019
Pedro Rocha	Painting	1967	1972	30th January 2019
Purificação Fontes	Sculpture	1964	1972	22th January 2019
Rodrigo Cabral	Painting	1968	1973	28th December 2018
Sobral Centeno	Painting	1969	1978	20th December 2018
Zulmiro de Carvalho	Sculpture	1963	1968	7th January 2019

Table 1: List of interviewees.

Many of these informants later became artists and professors in ESBAP and though currently retired, they still maintain their artistic activity. Hence, whenever possible, interviews were carried out in their art studios providing means to obtain a set of exclusive observations within the interviewees' testimonies (Banks & Zeitlyn, 2015), and the opportunity to witness first-hand, some of the practices that characterized their creative process and were integral to the methodologies they presented to their students (figure 1).

Figure 1: Studies for paintings by Lima de Carvalho. Photography @Cláudia Lima.

For the interviews, it was used a script with open-ended questions (Quivy & Campnhoudt 2008) focusing on the artists' experiences as students and professors, curricular and extracurricular relations, foreign associations and influences and impacts of the political landscape on their work.

The interviews were all filmed and photographed, allowing the creation of memory supporting documents for further scrutiny of the collected observations (Tinkler, 2013). At the beginning of each interview, informants were asked for permission to collect images and sound, through a document signed by them (Banks & Zeitlyn, 2015), and explained the purpose of these materials.

ESBAP learning practices in a pre-revolutionary period

In the period preceding the Revolution of April 25, 1974, the ESBAP was known for its pedagogical practices and school environment, attracting art students from all over the country. While the School of Fine Arts of Lisbon (the only alternative to ESBAP in art higher education, in Portugal) was considered a more academic and theoretical school and repressive in relation to contemporary art forms, ESBAP was known for being more liberal, with studio classes that enabled a more experimental approach.

This appreciated pedagogical environments and practices were partly due to its Director Carlos Ramos who was considered a modernist in his generation opened to the evolution and transformation of art. He encouraged the proximity of all school communities (students-faculty-staff), believing this would foster the sharing of knowledge and the understanding of different manifestations of art.

Before 1974, ESBAP offered courses in Painting, Sculpture and Architecture and had a faculty of distinguished figures from the Portuguese artistic scene, among them Dordio Gomes, Augusto Gomes, Barata Feyo, Júlio Resende, Lagoa Henriques, Gustavo Bastos or Ângelo de Sousa.

In the open-door classrooms of ESBAP, the sense of class was absent, with professors employing a more relaxed approach to enable open and unrestricted flow of knowledge and communication. Nonetheless, it was common for professors to talk about artworks in conceptual terms, without further explanations on techniques and practices. Professors would walk around the classroom while students work and if a student was not correctly performing a technique, they would mention that was not correct, yet failing to explain how to do it properly. Although the ESBAP professors, then designated by *Masters* as a kind of character's glorification, remained little in the classroom space (they arrived late and were absent before class ended) and were vague in their comments, several students of the time reported that the experience of the school was in itself a learning experience. As the classes were very small, there was great proximity between them, and between them, professors and all school staff.

The very structure and functioning of the school fostered this proximity. At the beginning of the school year, moments of conviviality were organized such as the acclaimed Magustos with bonfires jumps, singing and dancing in order to encourage further interaction and bonding between professors and students (figure 2).

Figure 2: Magusto, 1961: Bonfire Jump. Photography ©Elvira Leite.

The Magna Exhibitions were also an outstanding moment in the school and conducive to socializing and sharing of experiences. Held at the beginning of the school year, the Magnas were a showcase of artistic works made by students in the previous school year and selected by professors, opened to the public, attracting not only other artists but also several citizens interested in art. Another exhibition held at ESBAP at this time, and promoted by Carlos Ramos, was the Extra-Escolar with student artwork carried out in the studios and, therefore, with a less rigorous character in relation to the parameters and guidelines of the course.

The difficult access to information, especially from foreign countries, and the limited resources of the library also fostered greater proximity among the school community. Given the scarcity of contemporary art books in the school library (as well as in the country's libraries and bookstores), it was common for faculty to bring their own materials, books and postcards to show to students and to promote discussions often "in the convivial ground outside class", as one student said.

In fact, the conviviality and interpersonal relations went beyond the limits of the ESBAP and extended to iconic places in the city of Porto, such as the Teatro Experimental do Porto, Café Piolho or Café de São Lázaro. In these places debates were held covering various socio-political subjects and artistic themes that often focused on aspects of contemporary art not addressed in classrooms.

For many (but not all) students of this time the moments of conviviality, debate and practice of art also extend to the houses and studios of the professors. It was common for the Masters to organize parties in their homes to which they invited some students and various figures from the Portuguese artistic scene. It was also common for them to invite some students to work in their studios. These environments were equally conducive to the discussion of contemporary art forms that still had no framework at ESBAP.

These interpersonal relationships established inside and outside school result in paradoxical situations. On the one hand, several students remember these experiences as true moments of learning. On the other hand, there are a number of students who, not belonging to these circles of friendship, did not benefit from this learning ecologies. In this sense, it is observed that the learning process often progressed according to the richness of the relationships established between professors and students.

The results showed that the students who later became professors at ESBAP, relied on learnings from their experiences as students and either reproduced the good practices observed or counteracted the methods they considered dysfunctional. In fact, we verified the teaching models they developed later were derived from research processes that were based on empirical evidence, resulting from observation, interpretation and transfer of active/passive experiences. These models were tested in live scenarios before being adjusted and implemented as practice-based methodologies.

The emergence of design as a course

Although the practice of design was already well implemented in the period before the Revolution of April 25, 1974, the creation of higher education courses in this field only takes place in a post revolution period (Fragoso, 2012; Manaças, 2005; Nunes, 2016). In Porto, the first experiments in this field at ESBAP date back to 1962, when Professor Armando Alves proposed to introduce the Graphic Arts subject in the course of Painting, to replace the discipline of Decorative Painting, a subject he considered unsuited to contemporary artistic reality. Graduated in Painting from ESBAP, Alves already had a considerable portfolio in the area of Graphic Arts, which included the catalogues and posters produced for Magnas and Extra-Escolares Exhibitions commissioned by ESBAP director Carlos Ramos.

Due to the absence of background in this area, the approach to the discipline was thought and structured by Armando Alves based on his own experience and based on the observation of works done by other graphic artists. Since access and exchange of information across borders was very limited, his references were limited to the national environment. It was a very experimental approach, based on handcrafting, using existing reference materials such as the magazines *Marie Claire* or *Paris Match* which he considered publications "of great importance and great graphic quality" (personal communication, December 5, 2018). These publications were analyzed in the classroom and were also working materials: their graphic contents were collected, archived and reused in new graphic compositions in a "cut and paste" process. With these materials, which included clippings of letters, titles, texts or photographs, several projects were created as record covers or fictional book covers.

At the end of the school year, the results of this discipline were gathered and later exhibited at the Magna Exhibition. They were highly appreciated by the academic community. The Graphic Arts subject, initiated on an experimental basis within the Decorative Painting discipline, was thus stabilized in the course of Painting at ESBAP, with a similar approach over the following years: analysis of existing graphic work and renowned publications - occasionally from abroad and oriented to design, such as Graphis - and a practice characterized by experimentation and handcrafting.

At the turn of the decade, the discipline of Graphic Arts unfolds in two years, being taught in the 3rd and 4th year of the Painting course by Armando Alves and Amândio Silva, the latter also graduated in Painting. In 1973, Alves left his teaching activity to dedicate himself to painting and design. Thus, Domingos Pinho assumes the discipline of Graphic Arts as professor. In the years leading up to the Revolution of April 25, 1974, various essays were made in the field of Graphic Arts and the feasibility of creating a specific course in this area was studied. Illustration, poster design, comics and animation experiments were carried out, programs were designed and disciplines were structured, but the creation of the course only takes place in a post revolution period, when the ESBAP courses were reformulated.

According to students of that time, teachers migrated from the plastic arts' courses to the design course, the latter being based much on the idea of applying art to everyday life. Subjects such as Graphic Design, Specialized Graphics, Visual Communication, Editorial Graphics or Advertising Graphics were created, and the handicraft approach was maintained, with drawing, collage and gouache painting the common used

techniques. The students had as their most frequent instruments graphite, ruling pen, compass, ruler and square, and only the professor João Machado and the student João Nunes were familiar with Airbrush painting, due to their professional experiences outside the school.

In the years following the Revolution of April 25, 1974, the so called Design (Graphic Arts) course operates in ESBAP in an unofficial way. In the school year of 1980/1981, the course name changes to Communication Design (Graphic Art), privileging the concept of design and communication. But only January 22, 1983, were these courses - Design (Graphic Art) and Communication Design (Graphic Art) - recognized by the Portuguese Government in Diário da República[1], consisting of a primary three-year period, followed by a special two-year period.

Having this course emerged as a descendant of the Painting course, the understanding of design in this school has always been very associated with the image issue. According to one professor of this course, only later, when a first generation of design faculty with higher education in this area began to lecture at ESBAP, did design begin to be thought of in a different way, tending to become dissociated from the Plastic Arts. Even so, the derivations that emerged in design, were always very connected with the problem of image, and the concept of design as Industrial Design or Equipment Design, never really succeeded in Porto.

Intersections between the ESBAP generation and current generations in art education

With the materials collected and after its analysis, the results were (and still are being) disseminated through various channels, namely conferences and scientific journals. These channels, which effectively contribute to the inscription of the knowledge and experiences of the generations under study, are generally not consulted by the younger generations, becoming ineffective as regards the transgenerational transfer of knowledge. In this sense, a number of initiatives have been carried out aimed at greater intergenerational involvement and interaction and aimed at effective knowledge transfer.

One of these initiatives consisted of workshops in 3 universities in the north of the country: the first, an Illustration workshop, held between April and July 2019, at the Faculty of Fine Arts, University of Porto (FBAUP), formerly ESBAP; the second, a Multimedia workshop, held between October and November 2019, at the Instituto Politécnico do Cávado e Ave (IPCA); the third, a Typography workshop held between November 2019 and February 2020, at the Faculty of Communication, Architecture, Arts and Information Technology of the Universidade Lusófona do Porto (ULP).

Although the practical approach and the projects carried out in each workshop were different, it was decided to create an environment and working space with a set of common characteristics: all sessions were free with no basic requirements except for the commitment of the students; proximity between faculty and students was encouraged, dissipating notions of hierarchy in favor of a collaborative work; a

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1 Diário da República (DR) is the official government gazette of Portugal. It is published by Imprensa Nacional and includes the publication of Laws, Decree-laws and decisions by the Constitutional Court.

studio-like environment was created to foster greater sharing of ideas. Students were gathered in groups of 10 to 16 elements of different profiles and backgrounds. All projects were based on interviews with artists and study of their artwork, and participants were encouraged to research materials about these artists in addition to those already collected.

In October 2019, the results of the first workshop (of illustration) were exhibited at FBAUP (figure 3) in an event called *You look Familiar* that gathered several interviewees and former students of ESBAP (the silver generation), and current students, namely the workshop participants. More than an exhibition of works, this event provided moments of meeting, interaction and knowledge transfer between the silver generation and current generations.

Figure 3: Exhibition *You Look Familiar*. Photography @Cláudia Lima.

In parallel, during the months of November and December 2019, a set of 5 seminars were held open to the public, where, in each session, between 2 to 3 interviewees were gathered in an informal discussion about learning ecologies before and shortly after the Revolution of April 25, 1974, moderated by "an unlikely maestro", i.e. a moderator from another generation or from the same generation but without any association with ESBAP (figure 4). These seminars held in iconic places of the city of Porto, such as the Ateneu Comercial do Porto, Reitoria of the University of Porto or Instituto dos Vinhos do Douro e do Porto, attracted an audience of several generations, including former ESBAP students not yet interviewed (who actively participated in the discussions) and students participants of the workshops who, on their own initiative, used these moments to expand the research on this silver generation of artists for their projects and also to meet and interact with them.

Figure 4: Seminar nr 5, with the interviewees Paula Soares, João Nunes and Ana Campos, moderated by Susana Barreto (pictured on the left) and Eliana Penedos. Photography @Cláudia Lima.

In fact, we gathered that the workshops were a milestone in the transfer of transgenerational knowledge: a large part of the participating students revealed that they were unaware of the artists interviewed, contributing the workshops to the knowledge of artists and heritage that are part of local art history; many of the participants showed great motivation with this project, having expanded the research of information about these artists on their own initiative during the workshops – they visited the exhibition *You Look Familiar*, used the seminars for a greater knowledge of the artists in study and, in certain cases, established direct contact with the interviewees on whom their projects focused.

Given the success of the first exhibition and the workshops developed, other initiatives in this context are being planned, including an exhibition at the Reitoria of the University of Porto with the results of the Multimedia and Typography workshops (from IPCA and ULP respectively), and a second edition of the illustration workshop, at FBAUP.

Conclusion

In the period preceding the Revolution of April 25, 1974, ESBAP is described as a school with few resources, but with a group of distinguished professors from the Portuguese artistic scene and a pedagogical practice that gave the school greater recognition attracting art students from all over the country. Despite the scarcity of means in the early days, most of the interviewees remembered their time as students with affection and sense of belonging. The knowledge transfer from lecturers was insufficient, however the creative environment and cross-fertilization was a long-standing asset.

The absence of structured programs for the disciplines of the existing courses and the autonomy given to the faculty lead to several pedagogical experiments. It is in this context that the first pedagogical practices in the field of graphic arts are experimented and tested. The course in design appeared in a post revolution period, still unofficially, and was only recognized in 1983, by a law Decree.

These artistic and academic experiences that marked ESBAP and which are still reflected today in the school's sense of identity, tend to fade with the succession of generations, with many of the current art and design students unaware of local artists and their legacy. The workshops, seminars and exhibition held proved to be very positive for the dissemination of local art history and for the transfer of transgenerational knowledge.

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The Use of Digital Videos, LMS, Peer and Self-feedback to Improve Presentation Skills

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Abstract

An issue with conducting presentations in class is the one-off nature of the activity. Students present their topic and have little idea of how their own performance was except for their initial feelings, feedback from the instructor, and the grade they receive. However, improved access to mobile technology for both educators and students, coupled with the enhanced functionality of higher education learning management systems (LMS), has provided additional opportunities for the teaching of presentation skills in the classroom. One such opportunity is combining mobile devices, YouTube, and LMSs to allow teachers and students to record, upload, watch, and give both peer and self-feedback on in-class presentations. This paper will at first outline the need for peer review with oral presentations, focusing on the skills students can improve by watching and giving comments on both their own and their classmates presentations. The author will then outline the results of a survey related to the use of videos and peer review by 44 students in a private university in Western Japan. The results of the survey in general demonstrated that students felt positively towards the use of video and receiving feedback from their peers in this format. However, some were concerned about the privacy of the videos while others worried about receiving critical feedback from their peers. The results showed that re-watching presentations was most effective in improving presentation skills such as voice, grammar, speed, and eye contact.

Keywords: digital videos, LMS, peer review, self-review, presentations

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Introduction

Most university students at some point in their education will need to participate in the process of giving individual and group presentations. These presentations are usually based on a topic related to the curriculum and are used as a means of demonstrating that the information they have learned during the semester has been retained to an acceptable level. For some, giving presentations can be a stressful experience for reasons such as a lack of experience designing presentations and a lack of confidence when performing presentations, especially for those students who do not enjoy speaking in front of their peers. A further issue with presentations is the large grade weighting often associated with them considering that many are finished within a few minutes, with no chance to repeat or improve. Given the one-off nature of presentations, feedback that actually helps students improve their technique can often be absent. This paper will outline a study of 44 students at a university in western Japan that aimed to improve presentation skills through the use of digital videos as well as peer and self-feedback. The paper will show through a reflective survey that students are generally positive about their experiences giving and receiving feedback from re-watching their presentations and were able to find some aspects of their presentation that could be improved on in the future.

Literature Review

Japanese students come from an input poor environment in regards to English language experience outside of the classroom environment (Ota, 2009). In addition to this, the grammar translation method (Larsen-Freeman, 1986) used in Japanese foreign language education at the primary and secondary level is teacher-centered (Japan Times, 2013) with little to no opportunity for meaningful English output (Richards and Douglas, 2001). This means that by the time Japanese students reach the university classroom they may not have had any meaningful experience in designing and delivering English language presentations in front of an audience. Japanese students also enter university with little to no experience in the use of presentation software such as PowerPoint or Keynote and are thus not only overcoming a lack of presentation skills but also a lack of technical skills (Toland, Mills, & Kohyama, 2016).

Presentations in Japanese universities are often one-off in nature. In many courses the presentation is conducted in the final weeks of semester with little time for feedback or self-reflection. Feedback has been shown to be beneficial to Japanese students in academic writing skills (Morgan, Fuisting & White, 2014). Feedback itself at Japanese universities is often teacher-centered. The teacher as the authority figure in the classroom and provides feedback to the students based on their opinion alone. This can mean that although other students and the presenter themselves may want to contribute to the feedback, they are not given the opportunity to do so.

Methodology

This study was conducted in two core English classes and an English medium lecture class at a private university in western Japan. Students had to, as part of the curriculum, take part in at least one oral presentation. The presentations were recorded by the instructor on a mobile device and uploaded to the university learning

management system (LMS). Following this the students were required to re-watch their presentation and answer some questions relating to their performance. The students were also encouraged to watch other presentations and give feedback on them. The questions the students were required to answer are outlined below.

1. What did you and your team member do well in your presentation?
2. What do you think you could do better if you did your presentation again?
3. What do you think you personally did well in your presentation?
4. What do you think you could do better next time?
5. What is something that you noticed in the video that surprised you?

Following the conclusion of the formal feedback period, students were invited to participate in a 12-statement survey relating to the process of self and peer feedback on the presentations. The students were informed that participation in this survey was to be done on a volunteer basis and that participation had no effect on their grade; forty-four students completed the survey.

Results and Discussion

The results and discussion will aim to answer the following research question:

Did recording presentations on mobile devices, uploading them to the LMS and getting students to self-reflect have an impact on presentation skills?

The survey used a four-point Likert scale ranging from strongly disagree (1) to strongly agree (4).

Statements one "I enjoy giving individual oral presentations in English" (3.09) and two "I enjoy giving group oral presentations in English" (3.03) demonstrated that students enjoyed making individual and group oral presentations. These statements were important as it showed the base level of enjoyment of the students. While as an instructor it may be easy to assume that all students do not like giving presentations, the results of these questions showed the opposite to be true. Statement three "I watched my presentation on YouTube" (3.04) also highlights that students did actually watch their own presentation on YouTube. This is a critical statement for this research as without watching the video the students would not be able to proceed with the survey and make comments about their performance. It also shows that students are using the LMS resources provided by the instructor. Statement four "It was interesting to watch the video of my presentation on YouTube" (2.36) emphasizes that students were not particularly interested in watching their own video on YouTube when tasked to do so. There are many possible reasons for this result including a possible lack of interest in their videos or not wanting to participate in the extra work involved in watching the video. Statement five "I was nervous watching the video of my presentation on YouTube" (2.80) provides more answers to statement four. The students did not indicate that they were nervous about watching their own video which would suggest that the result for statement four are more to do with the extra work involved in watching the video again rather than any fears related to the re-watching of the presentation video.

Table 1

	Mean	Median	Mode	SD
1. I enjoy giving individual oral presentations in English	3.09	3	3	0.63
2. I enjoy giving group oral presentations in English	3.03	3	3	0.62
3. I watched my presentation on YouTube	3.04	3	3	0.71
4. It was interesting to watch the video of my presentation on YouTube	2.36	2	2	0.93
5. I was nervous watching the video of my presentation on YouTube	2.80	3	3	0.92

Statements six through nine of the survey related to the results of self and peer feedback. Statement six "I did not like getting advice from other students after watching my presentation on YouTube" (2.00) showed that students did like receiving feedback from other students, while statement seven "I received useful advice from other students after watching my presentation on YouTube" (2.76) in contrast highlights that the feedback received was not always useful in nature. Encouragingly statement seven demonstrated that the feedback received was not perceived as hurtful. When these three statements are analyzed together, we can see that there is some peer feedback being given by the students which is of a positive nature. Unfortunately, the feedback lacks any depth and is not considered to be particularly useful by the students. For example, common comments from students were set phrases such as "good job", "I like your slides", and "interesting topic." While it is encouraging that students feel they want to give some feedback to their classmates, the researcher can also see that there is a need to spend more class time focused on the appropriate way to give meaningful feedback to others. This could also indicate that students feel a sense of pressure and anxiety when asked to give feedback on others. This is similar to the results found by White, Fuisting & Morgan (2014) in peer feedback in academic writing in Japanese universities.

Table 2

	Mean	Median	Mode	SD
6. I did not like getting advice from other students after watching my presentation on YouTube	2.00	2	2	0.67
7. I received useful advice from other students after watching my presentation on YouTube	2.76	3	3	0.80
8. I received hurtful comments from other students after watching my presentation on YouTube	1.69	2	1	0.79
9. I was worried about the privacy of the video being available on YouTube	2.31	2	2	0.90
10. By watching my presentation on YouTube I found issues in relation to my PowerPoint Slides	2.87	3	3	0.73
11. By watching my presentation on YouTube I found issues in relation to my English vocabulary and grammar use.	3.07	3	3	0.72
12. By watching my presentation on YouTube I found issues in relation to my voice (volume, speed, and pronunciation)	3.18	3	3	0.65

Interestingly, statement nine "I was worried about the privacy of the video being available on YouTube" (2.31) showed that students were not overly concerned about their privacy when the presentation videos were uploaded to YouTube. The results here were most likely influenced by the instructor and researcher who anticipated some students might feel some anxiety when uploading presentations to YouTube. Due to this, the researcher informed the students on several occasions in class that the videos would be only available to the class members, would be unlisted, and would be taken down after the completion of the reflection period. Without the researcher doing this in class the results of this statement would probably have been much different.

In statements ten to twelve we can see that students agreed with statements eleven and twelve. The only statement that disagreed is number ten "By watching my presentation on YouTube I found issues in relation to my PowerPoint Slides." (2.87). This was expected as the students had spent several weeks in and outside of class designing and making the presentation and as such any issues with the slides were found at an earlier stage. Statements eleven "By watching my presentation on YouTube I found issues in relation to my English vocabulary and grammar use" (3.07) and twelve "By watching my presentation on YouTube I found issues in relation to my voice (volume, speed, and pronunciation)" (3.18) highlight that through watching the videos again the students were able to find mistakes in all areas of their presentation from vocabulary, grammar, and voice. The answers to these statements are the most encouraging for the current research as they demonstrate the need for peer and self-review when doing oral presentations. These results clearly indicate that the benefits will be long lasting meaning that the students will produce better oral presentations throughout their time at university and possibly in their future working career due to this simple activity.

The survey also had a free comments section where the students could share anything in relation to peer and self-review of oral presentations. These comments also provide evidence for the need for peer and self-review of oral presentations.

By watching my presentation on YouTube, I found many mistakes in my voice, speed rate was not as good as I was expecting and my pronunciation was also not as clear as it should be, the idea of watching your own presentation was really useful for me.

In this comment we can clearly see the benefits of self-review. The students while not mentioning their PowerPoint slides, has managed to find several issues with their own presentation delivery and specially comments on the useful nature of watching their presentation again.

I think it's better to upload the presentation video on YouTube, because on the positive side, we can reflect to ourselves, and see what we look from an audience perspective.

A second student commented in a similar positive manner to the first. As with the first student, this student also highlights the positives of watching their own presentation on YouTube. This student seems to be more concerned with what they look like to the audience, which may in this case be the driving factor for them to watch their presentation and improve for the future.

The purpose of this study was to examine the following research question:

Did recording presentations on mobile devices, uploading them to the LMS and getting students to self-reflect have an impact on presentation skills?

Encouragingly, it is the belief of the researcher that we can answer this question in the affirmative. Even though students mainly had a positive view of doing oral presentation by themselves and in groups, the results confirmed that students benefited in a positive manner from being a part of the review process. However, the results also indicated the students need training on how to conduct appropriate reviews on the presentations of other students.

We can see from the results presented above that it is most likely that watching their presentations again on YouTube and giving peer and self-reflection was beneficial for their overall presentation ability. The benefits were focused around the students' presentation skill related to English content, grammar, eye contact and voice. This is to be expected as these skills are the most difficult to teach and due to the student not previously being able to see themselves, also the most difficult to learn. Peer and self-review had made little difference to the slides. This result could be expected as the slides are able to be checked multiple times within the classroom setting. To find out concretely if this is the case the researcher would need to survey the students again after they had participated in other oral presentations.

Conclusion

This study of the use of peer and self-review in presentation has shown that there is a need for it in presentation classes. With presentations being one-off in nature students are not given the opportunity to view their own presentation techniques and are missing out on valuable opportunities to learn and improve. This study has demonstrated that students not only enjoy the process of giving presentation, but also can see how getting feedback from others and from themselves after reviewing their own presentations is a valuable activity. This research has also demonstrated that students need to be taught how to effectively give feedback to other students, as currently the student receiving the feedback does not believe it to be a useful experience. Although this is just one study with a limited number of students, the practical implications of this research are clear as is the need for further research in this area.

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Technology Acceptance Model for Pre - Service Teachers of Region I

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Abstract

The study aimed to determine the profile of College of Teacher Education Faculty and Pre-service Teachers; Adequacy and extent of Utilization for ICT – Based Instruction along hardware, software and peopleware; degree of Perceived Usefulness, Perceived Ease of Use, and attitudes towards the use of ICT in teaching; level of assessment of the respondents in terms of technological practices; degree of difficulties on frequency of use by pre-service teachers in the school; developed ICT-based instructional materials used by the pre-service teachers in practice teaching; and propose a Technology Acceptance Model for Pre-Service Teachers.The findings revealed that the profile of the respondents' majority is female. Majority of the respondents earned graduate or postgraduate degrees or earned postgraduate units. Most respondents are at the Instructor level in terms of academic rank. The level of adequacy and extent of utilization for ICT-based instruction is Moderate Adequacy / Moderately Extent, while the Perceived Usefulness is strongly agree / very useful in using ICT-based instruction. Assessment in terms of Technological Practices is excellent in surfing the internet for educational research. For Degree of difficulties concerning the frequency of use, respondents used ICT-based teaching activities four times a week. PowerPoint presentation with audio, and animation and using traditional-based instructional material ranked first in the availability of the developed ICT-based instruction. A Technology Acceptance Model is proposed to address the 21st-century education and Sustainable Development Goal of 2030.

Keywords: Technology Acceptance Model, ICT, Pre-Service Teachers

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Introduction

The 21st-century has brought about unprecedented changes in all fronts of life. These changes are due to the advancement of technology that is beyond anyone's expectations. During this period, the man not only conceptualized technical ideas but also used electronically operated mail, fax machines, cell phones, computerized databases and high – technology classrooms.

Technology has become a part of day-to-day life. It is revolutionizing education just as it is doing with all aspects of human life. This phenomenon is evident through computers being used in the education system because of their versatility. The internet is helping people learn informally by sharing information and facilitating communication by connecting people. These and other advantages of the internet and associated technologies are being merged to support education and training to improve and overcome the limitations of traditional learning methods.

Information and Communication Technology integration in instruction implies the utilization of technology-based teaching and learning innovations in schools. The ICT integration is deemed advantageous because students are familiar with technology, and they will learn better within the technology-based environment. Moreover, the utilization of technology in instruction contributes to the innovation of the curriculum in particular and education system in general.

Considering this present context, numerous higher education institutions realize and appreciate the possibilities of utilizing the innovation in classrooms as a viewpoint of improving the learning environment (Masrom, 2007). Information technology opens opportunities for instructors to incorporate innovative devices into the teaching-learning process, and include opportunities for collaboration, sharing, and interaction in learning (Suleiman, 2011).

Correspondingly, the State Universities and Colleges in Region I aim to produce quality teachers who have a positive image and who can be at par with other professionals in the region and the nation through a deliberate effort to improve instruction, research, extension, and production. Thus, the college brings its graduates at the helm of all professionals.

Furthermore, its mission is the preparation of globally competent teachers who are imbued with the ideals, aspirations, and traditions of Philippine life and are sufficiently equipped with pedagogical knowledge and skills. It is believed that this vision could be attained through the development of instructional materials to be used and the formulation of strategies and techniques to be implemented.

By the pertinent provision of the Republic Act 7722, otherwise known as the "Higher Education Act of 1994", the Commission on Higher Education (CHED) revised the policies and standards for undergraduate teacher education curriculum to keep at pace with the demands of global competitiveness. As stated in Article I, Section I of the CHED Memo No. 30 series of 2004, the quality of pre-service teacher education is a vital reason for quality Philippine education.

The researcher has observed that today's generation begun to cling tight to the fast development of thoughts and know-how. Technology evolved in various ways. People continued to delve into a large range of interest in ICT. Mass media has set out on the same innovation to fulfill its reason. With the headway of innovation, educating and learning ought to have ended up exceeding available, anyplace (Fu, 2013). However, there are, in any case, challenges that proceed to introduce within the way (Bingimlas, 2009).

In this research, these focuses were utilized to evaluate the status levels of pre-service instructors on ICT-based instruction. To couple, such appraisals are the self-assessment of status by the pre-service instructors themselves. These avocations and comparisons may be adequate to outline curricular change in instructor instruction making ICT-based guidelines methodologies and procedures at the bleeding edge of pre-service instructor preparation.

With all these in consideration and in the context of teaching Educational Technology in Region I, it is important that classroom environment and experiences using computers be made available for all learners. The main purpose of this study is to examine pre-service teachers' attitudes towards digital learning and to analyze the effectiveness of ICT integration from teaching and learning perspectives and the effective elements of ICT integration using TAM in teaching.

Objectives of the Study

This study aimed to propose the Technology Acceptance Model for pre-service teachers in Region I. Specifically; it answered the following problems:

1. What is the profile of the respondents regarding the following:
   a. College Education Faculty respondents
      a.1 sex,
      a.2 age,
      a.3 highest educational attainment,
      A.4 academic rank,
      a.5 number of years in service, and
      a.6 number of training / seminars attended?
   b. Pre-service teacher respondents
      b.1 sex,
      b.2 age,
      b.3 course, and
      b.4 major/area of specialization?
2. What is the level of adequacy and extent of utilization of resources for ICT based instruction in terms of:
   2.1 hardware,
   2.2 software, and
   2.3 peopleware?
3. What are the degree of Perceived Usefulness, Perceived Ease of Use, and attitudes of pre-service teachers and college of teacher education faculty towards the use of ICT in teaching?

4. What is the level of assessment of the respondents in terms of technological practices:
   a. Students as assessed by faculty, and
   b. Faculty as assessed by students?
5. What is the degree of difficulties concerning frequency of use by pre-service teachers in the school?
6. What are the developed ICT-based instructional materials used by the pre-service teachers in practice teaching in terms of:
   a. Utilization, and
   b. Availability?
7. What validated technology acceptance model for the pre-service teacher can be proposed?

Methodology

This study employed the descriptive method with quantitative and qualitative data since this research was designed to find out the facts about present status. The researcher, in this case, adopted the descriptive research method.

This study was conducted among the selected State Universities and Colleges of Region I the basis of selection is based on the policies and guidelines. Respondents of the study were the pre-service teachers, specifically the Fourth Year Education students and the College of teacher education faculty. Total enumeration of College of Teacher Education faculty respondents was employed to come up with a more reliable result.

The first stage of this research consisted of the gathering of quantitative data and information. The next stage was the focus group discussion in which the pre-service teachers shared their ideas on ICT-based instructional materials, which they usually developed and used in their practice teaching.

A set of standardized survey questionnaire with TAM as the guide was used in this research work. Some modifications were done to fit the context of the research study. This was employed to gather significant information to answer specific problem stated in the study. The questionnaire was in the form of checklist and rating scale.

Focus Group Discussion was conducted with administrators, faculty members and students to enhance the discussion of the study based on feedbacks provided by the participants.

These processes are the basis for the preparation and validation of proposed Technology Acceptance Model for pre-service teachers of Region I.

Results and Discussions

Profile of the College of Education Faculty

Sex

It can be gleaned from Figure 1 that the majority or 72% of the College of Education Faculty in Region I are female. This implies that teaching is more suited to women and considered a less-masculine profession in the society.   Based on the result of the focus group discussion, preferably both male and female will become teachers, especially primary teachers so that it can be a bit balance for children development.
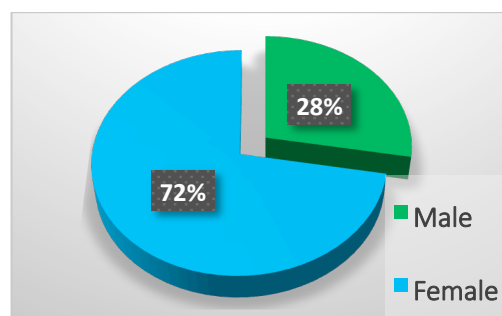
Fig. 1. *Profile of the College of Education Faculty along Sex*

Gender roles and stereotypes find a coherent explanation in gender ideology. The basis of most gender ideology is biological determinism, the thesis that the biological differences between men and women dictate a difference in social roles as well. The logic goes: because women are the ones physically prepared to bear and nurture children (Dionisio, 1994).

Damme (2017) states that gender imbalances the teaching profession measure the results of women's acutely aware and strategic decisions the maximum amount as of labour market conditions, social norms and cultural messages. Also, stereotypic view of teaching as a profession that, at times, resembles parenting, in all probability play a job, particularly with younger generations of girls UN agency apparently price.

Age

The profile of the College of Education Faculty in Region I along age is shown in Figure 2.   A marked percentage of the respondents or 20.14% belong to the age bracket 36 - 40 years old. Age brackets of 31- 35 and 41- 45 got 15.28%. On the other hand, age brackets 46 - 50 and 26 - 30 got 10.42% while only 1.38% fall under the age bracket 61 - 65 years old. Age 61 – 65 is mandatorily a retirement age under Republic Act 7641 known as an act amending article 287 of presidential degree no. 442, as amended, otherwise known as the labor code of the Philippines, by providing for retirement pay to qualifies private sector employees in the absence of any retirement plan in the establishment.
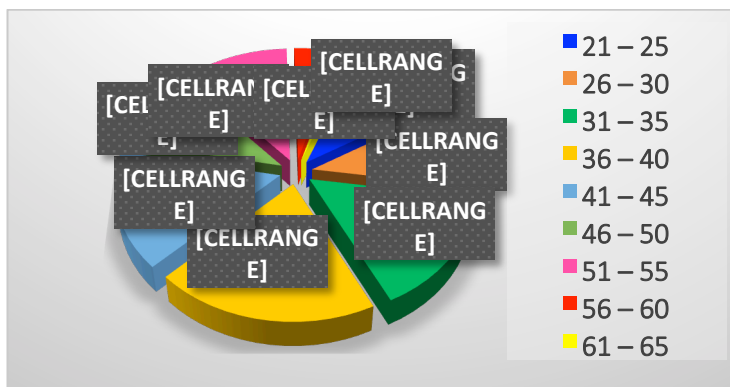
Fig. 2. *Profile of the College of Education Faculty along Age*

Highest Educational Attainment

As shown in Figure 3, the level of educational attainment of the majority of the respondents earned graduate or postgraduate degrees or have earned units towards a higher level of academic degree. Those with doctorate units registered the highest population with 40.28% while the lowest with 2.77% of the respondents are bachelor degree holders.   The figure presents that most respondents had relatively high educational attainment which accounts for a positive significant impact on their job performance, wage level, and professional development. This is to conform of strict Civil Service Commission and Commission on Higher Education requirement for teaching positions to be filled up at least one step higher to their students or at least master's degrees aligned to their fields or area of specialization.
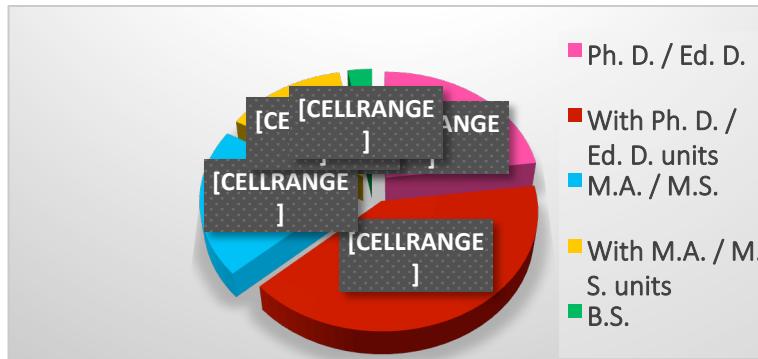
Fig. 3. Profile of the College of Education Faculty along Higher Educational Attainment

Educational attainment distinguishes people on a vertical scale, i.e. academic attainment classes will mostly (although typically not entirely) be ordered hierarchically. Academic attainment refers to a crucial direct outcome of education (Jenkins & Sabates, 2007), as opposed to rather than the info (e.g., intellectual capacity; exertion), process (e.g., instructive pathway taken, full‑time or part‑time study) or aberrant results of training (e.g., pay). The most elevated level of instruction finished is either demonstrated by the most elevated instructive capability (professional or scholastic) accomplished, or by the quantity of long stretches of training or tutoring finished (in which case every year is viewed as a sort of level).

As shown in Figure 4, almost all of the College of Education Faculty or 90.97% have education related courses. The data reflects that most of the faculty members had

obtained a degree in Education which is the response to the call for Education-related teaching positions.   Only 9.03% are not aligned to Education.
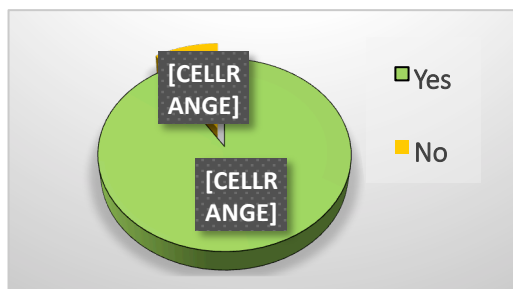
Fig. 4. Profile of the College of Education Faculty along Highest Educational Attainment is Education Related

Arabejo (2016) states that one of the parameters which gauge the quality of the Higher Education Institutions (HEIs) is the academic qualifications of the faculty members. It is also measured by faculty research outputs and other scholarly works which are relevant to their chosen discipline. Professors of different colleges and universities are expected to possess the necessary skills and competencies in their discipline. They are high performing professional educators who contribute to the generation and transmission of new knowledge. However, not all faculty members in every HEI are vertically aligned regarding degrees and outputs. One of the worries which the administration investigates is to realign educators at all levels most particularly in Higher Education Institutions (HEIs). Achievement in the execution of a scholastic program depends, all things considered, on the nature of the personnel.

Academic Rank

It can be observed in Figure 5 the academic ranks of the College of Education faculty in Region I; most faculty members were in Instructor level or 38.89%.   There was 31.25% Assistant Professor, 19.44% Associate Professor while there was only 10.42% holding a full professor plantilla position.
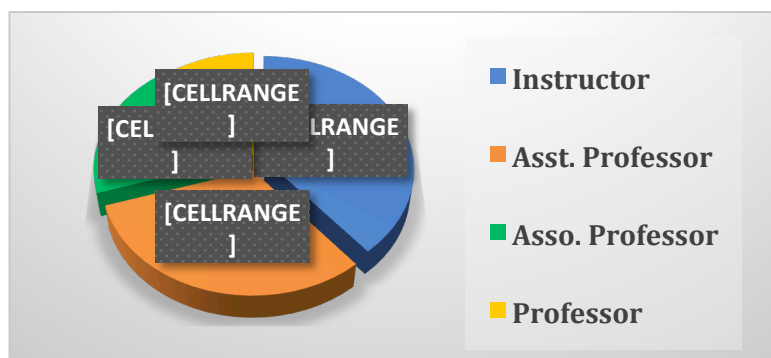
Fig. 5. *Profile of the College of Education Faculty along Academic Rank*

The National Budget Circular (NBC) 461 provides the guidelines for the promotion of faculty members in state universities and colleges. The areas where each of the faculty members are evaluated including educational qualification, experience and length of service, professional development, achievement, and honors received. Every faculty member is encouraged to prepare themselves for evaluation as promotion may indicate professional growth and development and provides the

respective universities with high profiled faculty members as one necessary are for accreditation.

Number of Years in Service

As to the respondents' length of service, Figure 6 reveals that 23.61% of the respondents have rendered services for 6 – 10 years. This followed by less than one percent who have served for 36 – 40 years.
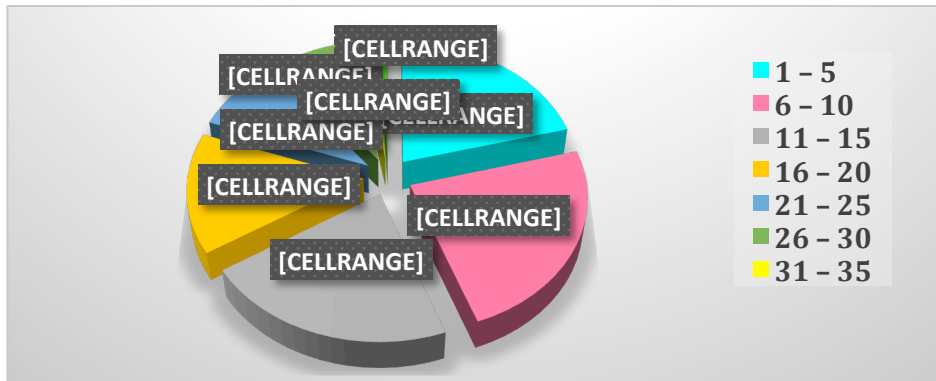
Fig. 6. *Profile of the College of Education Faculty along Number of Years in Service*

Some research shows that instructors with over 20 years of experience are more successful compared to educators with no experience. Studies have additionally recorded some proof that viability decreases after some point, especially among secondary teachers. Some evidence recommends that the most experienced (more noteworthy than 25 years) secondary school arithmetic instructors might be less powerful than their less experienced partners (Ladd, 2008) and even their unpracticed associates (Harris & Sass, 2007).

Number of Training and Seminars Attended

It can be gleaned from Figure 7 that 43.03% of the respondents attended training and seminars 1 – 4 times, 3.47% attended 21 and above and 2.08% never attended training seminars and at all.
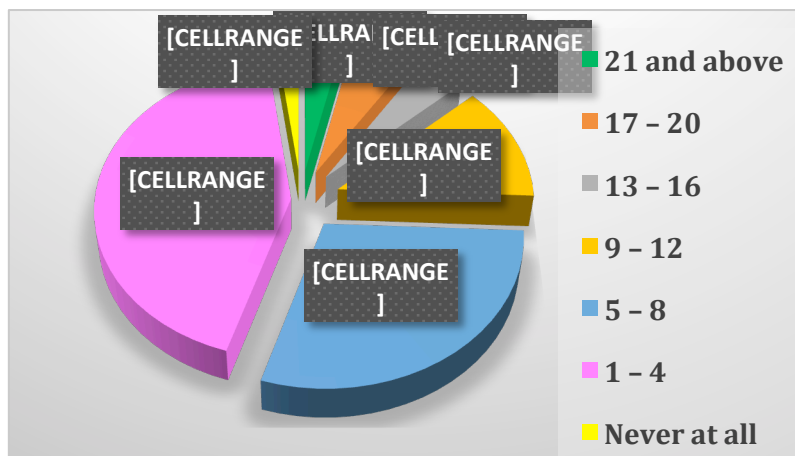
Fig. 7. *Profile of the College of Education Faculty along Number of Training and Seminars Attended*

Educators' expert improvement is a key factor to a fruitful mix of PCs into homeroom instruction. Sandholtz and Reilly (2004) guarantee that educators' innovation abilities are solid determinants of ICT joining, yet they are not conditions for viable utilization of innovation in the study hall. They contend that preparation programs that focus on ICT instruction rather than specialized issues and specialized help assist educators more successfully with applying advances in instructing and learning. Researchers thinks that quality expert preparation assists educators with executing innovation and change (Brinkerhoff, 2006; Diehl, 2005). Uncivilized and Pellegrino (2007) guarantee that if the preparation program is of high caliber, the period for preparing becomes longer and new advancements for instruction get to be offered. With this, teachers will be associated with significant substance exercises, and cooperation among partners will improve and an unmistakable vision for understudy will be achieved. Educators may receive and incorporate ICT into their encouraging when preparing programs focus on the topic, qualities, and innovation.

Profile of the Pre- Service Teachers

Sex

The graphical presentation of the sex profile of pre-service teachers as shown in Figure 8 reveals that 77% are females and 23% are males.
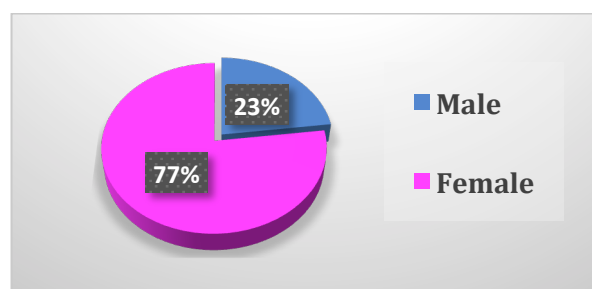
Fig. 8. *Profile of the Pre-Service Teachers along Sex*

As a result of focus group discussions, they took teaching as their course because of it is their parent's choice. Other respondent says it's their passion since childhood and opportunity to work with young people and make a difference in their lives, that there's the chance to inspire students in the way their teachers inspired them.

Age

Figure 9 shows the graphic presentation of the age profile of pre-service teachers. It can be seen that 46% of the pre-service teachers are 20 years old while 1.60% of the respondents are ages 18, 22 and 23 and less than 1% of them are 24 and 25 years old respectively. Based on the result are the transition from adolescence (12-19 years old) and young adult hood (20 – 40 years old). Early adulthood comprises the cohort currently between 20-24 years of age belong to the millennial or Net generation (Prensky, 2011) and the cohort currently aged 25-40, who are known as generation X.

Piaget (1976) termed the stage of adolescence as the period of formal operations. Adolescents have attained a new, higher-order level of reasoning superior to earlier childhood thoughts. They are capable of abstract thought and complex logical

reasoning described as propositional as opposed to syllogistic. Their reasoning is both inductive and deductive, and they are able to hypothesize and apply the principles of logic to situations never encountered before.
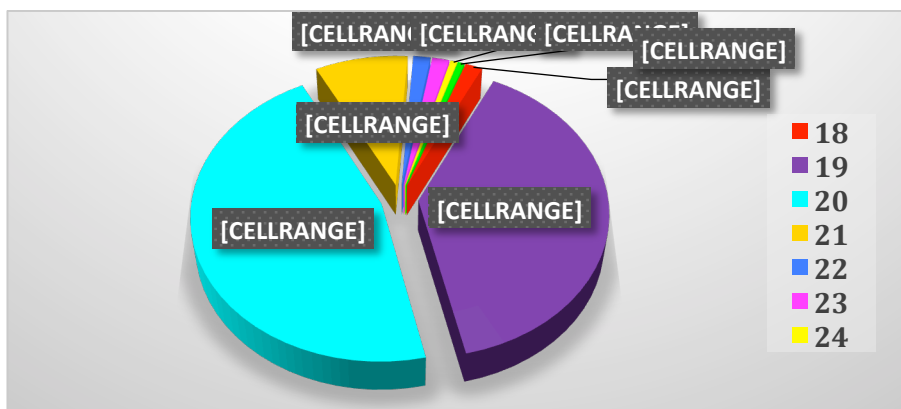
Fig. 9. *Profile of the Pre-Service Teachers along Age*

Young adults continue in the formal operations stage of cognitive development (Piaget, 1976). These experiences add to their perceptions, allow them to generalize to new situations, and improve their abilities to critically analyze, problem solves, and make decisions about their personal, occupational, and social roles. Their interests in learning are oriented toward those experiences that are relevant for immediate application to problems and tasks in their daily lives.

Teacher Education Programs

Figure 10 presents the graphic presentation of the course profile of the pre-service teachers. It can be noted that out of 313 pre-service teachers 39 % are in Bachelor of Secondary Education (BSEd) course followed by 38.98% who are Bachelor of Elementary Education (BEEd), while 21.08% belongs to Bachelor of Science in Industrial Education. Passing the Licensure Examination for Teachers is one of their requirements to be considered in choosing what course in education they take.
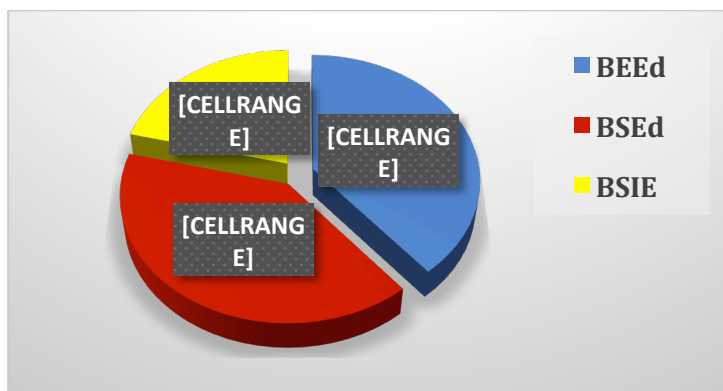
Fig. 10. *Profile of the Pre-Service Teachers along Teacher Education Programs*

As indicated by Ozbek (2007) understudy educators pick their profession with individual factors as opposed to financial and social components. In addition, in some different study, it is guaranteed that understudy decides to educate as a vocation since it is an independent calling while some others imagine that they can remain youthful

in this profession. Also, while a few up-and-comers believe that they can raise their children in this profession simpler than some other work, some others have some ideological methodologies like affecting youthful ages (Kelly, 2012; Lawver & Torres, 2011). Hacıomeroglu and Taskın (2010) found that while a few applicants pick the career as they believe that the profession is good and they like teaching children, others feel that the profession will satisfy them. Tataroglu, Ozgen, and Alkan (1998) assert that they have an interest and love in educating, consider the to be as a proper, decent and favored work.

Major / Area of Specialization

The figure presents the graphical representation of the pre-service teachers along major / area of concentration of the State Universities and Colleges in Region 1. As reflected in Figure 11, the result shows that 36.10% were General Education major in the BEEd program. General Education course covers all of the basic information for teaching in primary education. In addition, it is a field of study that has no specific specialization because students are considered generalists thus, a challenging course.

Less than 1% were major in Garments and Fashion Design, Chemistry and Special Education (SPEd). In connection with the previous study, BSIE is the least among the course selected in the Region. This is due to the little opportunities in employment and success in the board examination for teachers.

Garments and Fashion Design is one of the major of Bachelor of Industrial Education Course. Like the BSEd and BEEd programs, the BSIE program also includes General and Professional Education Courses. Graduates take the Licensure Examination for Teachers (LET) to allow them to become professional teachers. BSIE is a ladderized program, meaning that students who complete each year level and pass the TESDA Competency Assessment are issued the National Certificate (NC) of that particular level.
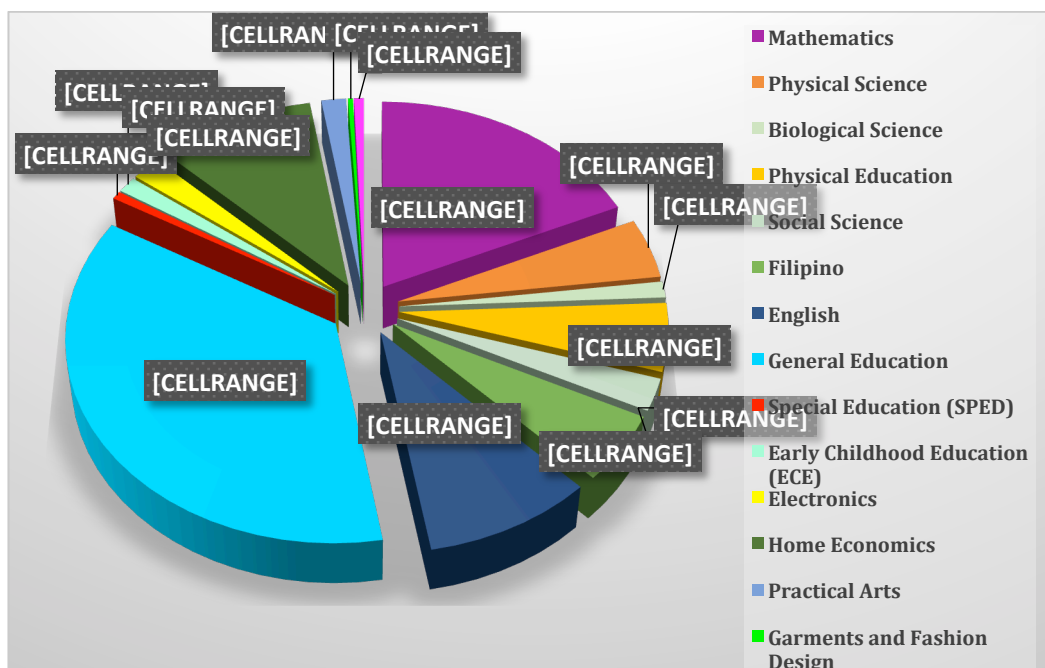
Fig. 11. *Profile of the Pre-Service Teachers along Major / Area of Specialization*

Level of Adequacy and Extent of Resources for ICT - Based Instruction

Table 1 presents the level of adequacy and extent of utilization for ICT-based instruction. The level of adequacy for ICT-based Instruction is High Adequacy as supported by the grand mean of 3.41. The indicator software, which include the Word Processor, Desktop Publishing, Calculation Spreadsheet Worksheet Maker, Slide Presenter, Multimedia Authoring, Image and Drawing Editor, Web Page Maker, Test Maker, Math Study helper, Science Study Helper, English Study Helper, e-mail, Weblog and Wiki, and File Sharing, earned an average score of 3.52 that means High Adequacy for ICT-based instruction. Peopleware that includes the Computer Technician, MIS Officer, IT Officer, Network Administrator, System Administrator, System Analyst, Programmer and Computer Operator / Encoder ranked the least with an average of 3.35 which is Moderate Adequacy. For the extent of utilization, software ranked the highest for ICT -based instruction with an average score of 3.44 which is High Extent, while peopleware ranked the least with an average of 3.28. This extent of utilization for ICT-based instruction has gained 3.34 average which is Moderate Extent.

	Level of Adequacy				Extent of Utilization			
	Pre-Service teachers	College of Education Faculty	Mean	DR	Pre-Service teachers	College of Education Faculty	Mean	DR
Hardware	3.36	3.35	**3.36**	MA	3.35	3.26	**3.31**	ME
Software	3.49	3.54	**3.52**	HA	3.52	3.35	**3.44**	HE
Peopleware	3.41	3.29	**3.35**	MA	3.35	3.21	**3.28**	ME
GRAND MEAN	**3.42**	**3.39**	**3.41**	HA	**3.41**	**3.27**	**3.34**	ME

Legend: **DR** – Descriptive Rating   **HA / HE** – High Adequacy / High Extent   **MA / ME** – Moderate Adequacy / Moderate Extent
Table 1. Level of Adequacy and Extent of Utilization for ICT – Based Instruction

Lau and Sim (2008), conducted a study on the degree of ICT adaptation among 250 teachers in Malaysia. Their discoveries uncovered that more established educators oftentimes use PC innovation in the homerooms more than more youthful instructors.

Perceived Usefulness, Perceived Ease of Use and Attitudes Towards the Use of ICT – Based on Teaching

Table 2 shows the perceived usefulness, perceived ease of use and attitude towards the use of ICT-based in teaching. Perceived Usefulness acquired the descriptive rating of strongly agree / very usable with a weighted mean of 4.33, while perceived ease of use acquired the agreeable/usable rating. The grand mean is 4.24 tagged as strongly agree / very usable. This further signifies that the pre-service teachers and college of education faculty perceive the use of ICT as beneficial in enabling students to be more active and engaged in the lesson.

	Pre-Service Teachers	College of Education Faculty	Mean	DR
Perceived Usefulness	4.20	4.46	**4.33**	**SA/VU**
Perceived Ease of Use	3.98	4.21	**4.09**	**A/U**
Attitude towards the Use of ICT in Teaching	4.23	4.36	**4.30**	**SA/VU**
GRAND MEAN	**4.14**	**4.34**	**4.24**	**SA/VU**

Legend: **DR** – Descriptive Rating   **SA / VU** – Strongly Agree / Very Useful
A / U – Agree / Useful

Table 2. Perceived Usefulness, Perceived Ease of Use and Attitude towards the use of ICT-based in Teaching

Level of Assessment in terms of Technological Practices

Table 3 presents the data on the level of assessment in terms of technological practices. It evaluates the students as assessed by faculty and faculty as assessed by students.   Based on the data, the item "ICT is used in surfing the internet for educational research" which obtained the highest weighted mean rating of 4.36 described as "Excellent", got the lowest weighted mean rating 3.64, the item "All ICT tools in the school are taken many advantages of because teachers minimally use them" tagged as "Very Good". The level of assessment in terms of technological practices has an overall mean of 3.99 described as "Very Good."

Many teachers are allowing students to use the Internet as a source of information for research projects assignments. Honey (2005) stated that, according to the National Center for Education Statistics (NCES), public schools had made consistent progress in expanding Internet access in instructional rooms.

ICT practices	Students as assessed by faculty	Faculty as assessed by students	Mean	DR
1. ICT is used in doing student-teaching tasks	4.16	4.18	**4.17**	**VG**
2. ICT is used in surfing the internet for educational research	4.35	4.37	**4.36**	**E**
3. Download and upload curriculum resources from/to websites or learning platforms for students to use.	4.22	4.20	**4.21**	**E**
4. There is computer laboratory in the school in which teachers can bring students there to watch educational videos.	3.79	3.97	**3.88**	**VG**
5. ICT is used in preparing and organizing school tasks, projects, and paper works	4.16	4.20	**4.18**	**VG**
6. ICT facilities in the school are well-functioning and can be used	3.73	3.96	**3.84**	**VG**
7. Technical supports are provided if teachers are faced with difficulties.	3.80	3.84	**3.82**	**VG**
8. Frequent access to internet prevents the teacher from using it in teaching.	3.63	3.79	**3.71**	**VG**
9. Support from the school top management encourages the teacher from using ICT.	3.87	3.89	**3.88**	**VG**
10. Instruction time is enough for the teacher to use ICT for teaching and learning process.	3.90	4.35	**4.12**	**VG**
11. There are enough training and professional development provided for teachers about ICT use in teaching.	3.84	3.73	**3.78**	**VG**
12. All ICT tools in the school are taken many advantages of because teachers minimally use them.	3.61	3.68	**3.64**	**VG**
13. Teachers are given more time to learn and be comfortable with the use of ICT in teaching.	3.92	3.84	**3.88**	**VG**
14. ICT is used in communicating and transmitting documents through emails, social network groups.	4.18	4.13	**4.15**	**VG**
15. Teachers are given the freedom to design their teaching with the help of ICT.	4.20	4.22	**4.21**	**E**
Mean	**3.96**	**4.02**	**3.99**	**VG**

Legend: **DR** – Descriptive Rating   **E** – Excellent   **VG** – Very Good

Table 3. Level of Assessment in terms of Technological Practices

Degree of Difficulties Concerning Frequency of Use

Table 4 presents the data on the frequency of use in ICT-based teaching activities of the pre-service teachers and college of education faculty of the State Universities and Colleges in Region I.   It has an overall mean of 3.68 described as "Often" or they use ICT-based in teaching activities four times a week. Among the indicators, the highest weighted mean rating was *"making lesson presentations with the use of relevant applications"* with an average weighted mean rating of 4.11 described as "Sometimes" or four times a week use in ICT-based in teaching activities.   The indicators with the least frequency of use in ICT-based in teaching activities with a mean rating of 2.97 tagged as "Often" or used ICT three times a week is *"Online interactive teacher-student meetings".*

It is also interesting to note that in the study of Fox and Bird (2017), some teachers, unlike other members of society, do not all use social media. They explained that there are some teachers who avoid it; some experiment with it while others embrace it enthusiastically. They further theorized that as a means of communication available to everyone in modern society, "*social media is challenging teachers, like other professionals in society, to decide whether to engage with these tools and, if so, on what basis – as an individual (personally), or a teacher (professionally)."*

ICT-based teaching activities	Pre-Service Teachers	College Education Faculty	Mean	DR
1. Online interactive teacher-student meetings	2.92	3.03	**2.97**	**S**
2. Surfing internet for research and downloads	3.89	3.79	**3.84**	**O**
3. Organizing school tasks and reports using computer applications	3.80	3.69	**3.74**	**O**
4. Computing grades and the like using computer applications	3.90	3.99	**3.95**	**O**
5. Making lesson presentations with the use of relevant applications	4.17	4.05	**4.11**	**O**
6. Preparing database of student records for storage and easy retrieval	3.80	3.77	**3.78**	**O**
7. Creating video clips and other hypermedia instructional aids	3.73	3.77	**3.78**	**O**
8. Networking in professional groups online	3.31	3.43	**3.37**	**O**
Mean	3.69	3.68	**3.68**	**O**

Legend: **DR** – Descriptive Rating **O** – Often (four times a week) **S** – Sometimes (three times a week)

Table 4. Frequency of use in ICT-based in Teaching Activities

Developed ICT-based instructional materials used by the pre-service teachers in practice teaching along utilization and availability

Table 5 shows the developed ICT-based instructional materials used by the pre-service teachers in practice teaching. In the availability of the developed ICT-based instruction, using traditional-based instructional materials ranked the first but the utilization of this traditional based instruction ranked second. This means that teachers today prefer to use modern educational technologies in teaching their students.

PowerPoint presentation with audio and animation ranked second in the availability of developed ICT-based Instruction with the percentage equivalent of 30.99% while in the utilization of developed ICT-based instruction, it ranked first with 36.74%.

Multi Media Presentation ranked third in the availability and utilization of developed ICT-based Instruction. Based on the result, 56 of the respondents access Multimedia, but 66 out of 313 utilized this technology in their practice teaching because it helps students visualize difficult concepts or procedures. In Digital presentation storytelling, 13 of the respondents developed but only 11 utilized the used of it because of lack of technology resources used in their teaching. Furthermore, the pre –service who utilize game and puzzles is 3.83%, while its availability is 3.51%. Also, 1.28% of the respondents have utilized the developed Spreadsheets to compute specific mathematical problems and creating graphs, while its' availability is 2.56%. On the hand 1.60% is available in their school, and less than 1% of the respondents have utilized the used of Smartboard presentation in the classroom because of the limited information and knowledge how to use this technology.

Based on the result of focus group discussion, two out of five schools have 1:1 computer-to – student ratio in a laboratory class, but for them to achieve that ratio they divide the class into two. Other schools have the of 1:3 and 1:2.

The results are contradicted by the CHED CMO 25 s. 2015 Section 16 of Article VI, Laboratory and Physical Facilities under Laboratory requirements state that the number of terminals dedicated to computing students should be at least 1/5 of the total number of computing students. This is to allow each student to have enough individual hands-on computer time per week. The computer-to-student ratio in a laboratory class should be 1:1.

Developed ICT—based Instructional Materials	Availability of the developed ICT-based Instruction			Utilization of developed ICT-based Instruction		
	f	%	Rank	*f*	%	Rank
Multi Media Presentation	56	17.89	**3**	66	21.09	**3**
Games and Puzzles	11	3.51	**5**	12	3.83	**4**
PowerPoint presentation with audio and animation	97	30.99	**2**	115	36.74	**1**
Spreadsheets	8	2.56	**6**	4	1.28	**6**
Digital presentation story telling	13	4.15	**4**	11	3.51	**5**
Using Interactive Television	3	.96	**8**	2	.64	**8**
Using smartboard presentation	5	1.60	**7**	3	.96	**7**
Used Traditional -based Instructional materials	120	38.34	**1**	100	31.95	**2**
TOTAL	313	100		313	100	

Table 5. Developed ICT-based instructional materials used by the pre-service teachers in practice teaching along utilization and availability

Proposed Technology Acceptance Model of Pre-Service Teachers

The proposed model as shown in Figure 11 reveals the interrelationships of External and Internal Variables, Digital Natives, Enhanced ICT Integration, Developed Innovation, Developed Pedagogical Skills and 21st-Century Teachers will bring about for the proposed Technology Acceptance Model of Pre-service teachers and address the 21st-Century Education and Sustainable Development Goals no. 4 (quality education).

External and internal variables. The model espouses profile of the respondents for pre-service teachers namely: gender, age, course, and major/area of specialization. For faculty respondents namely: gender, age, highest educational attainment, academic rank, number of years in service, and number of training/seminars attended in Information Communication Technology. While in internal variables, include the cognitive, affective and behavioral response of the pre-service teachers and education teacher towards the use of ICT in teaching.

Digital Natives. It refers to the preservice teachers who were born after the widespread adaptation of digital technology. It does not refer to a particular generation. Instead, it is a catch-all category for children who have grown up using technology like the Internet, computers and mobile devices.

Enhanced ICT Integration. This refers to the result of the usefulness, ease of use and attitudes towards the use of ICT-based in teaching. Teachers and administrations' attitude towards the use of ICT is key to enhance the integration, e.g., plan and commitment of management and school, infrastructure (comp. Lab., multimedia center, etc.), Educational Resources, Coordination and maintenance, Training (technical and didactical teachers and school).

Developed Innovation. The model embraces that the digital natives should enhanced ICT integration in their teaching for them to developed innovation ICT-based instructional materials used in their practice teaching.

Developed Pedagogical Skills. The model pursues the developed Pedagogical skills, which refers to the teaching skills teachers have and the activities these skills generate to enable students to learn the knowledge and skills related to different subject areas. The model embraces the principles of Blooms' Taxonomy, Dale's cone of experience and teaching instructional model.

Practice Teaching. As regards ICT-based teaching, pre-service teachers believe that they are ready to face their students' learning concerns based on the pedagogical skills they have developed.

21st Century Teachers. The model pursues the concept of 21st century teachers.
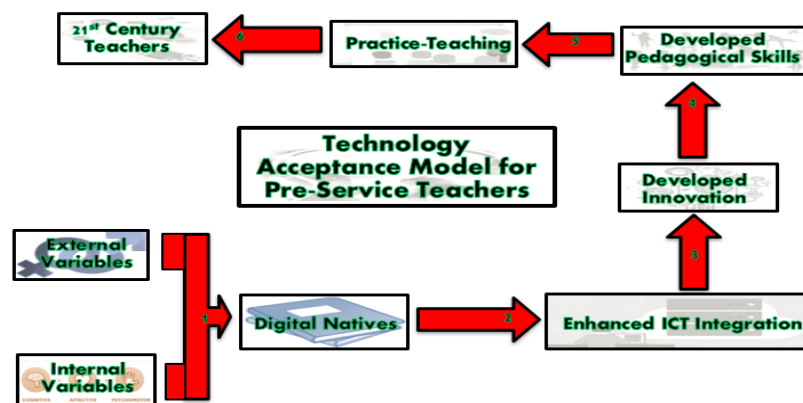
Fig. 12. Proposed Technology Acceptance Model for Pre-Service Teachers
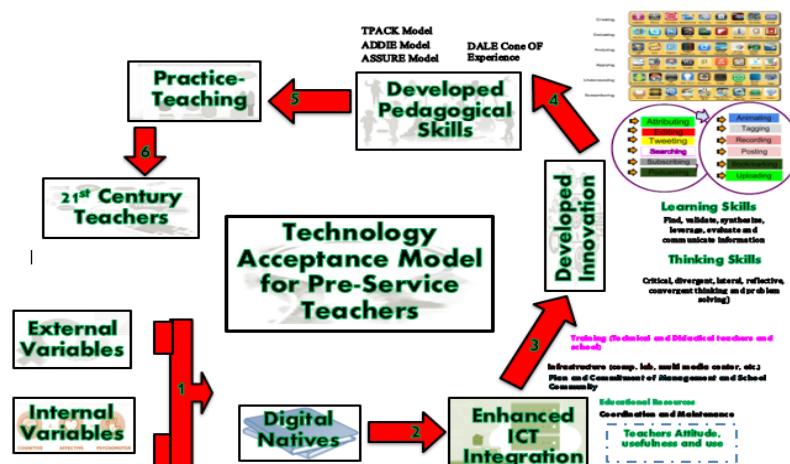
Fig. 12.a Proposed Technology Acceptance Model for Pre-Service Teachers

Conclusions

In light of the findings, the following conclusions were drawn:1. College of Teacher Education faculty are predominantly female and they belong to the middle age with doctorate units, a degree in Education and with limited training and seminars. Pre-Service Teachers belong to the age of younger age, majority are Bachelor of Secondary Education students and but specialize in General Education of Bachelor in Elementary Education courses. 2. The extent of utilization of ICT resources in teaching and learning process has a significant influence on teaching to produce quality graduates that compete in the global university. 3. ICT-based resources are

very useful in teaching and learning. 4. The efficient use of technology like ICT develops work outputs necessary to improve and enrich the concepts and theories of ICT-based teaching. 5. The frequency of use of ICT-based teaching activities is attributed to ICT resources (hardware, software, and peopleware). 6. Developed ICT-based instructional materials utilized to promote effective learning as well as to meet the demand of the 21st century teaching skills. 7. The proposed Technology Acceptance Model for Pre-Service Teachers can be integrated and adapted as a guide in teaching and learning process of the pre-service teachers.

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Management And Multiculturalism In Romanian Universities:
A Case Study At University Of Medicine And Pharmacy
„Grigore T. Popa" Iasi

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Abstract
The paper aims to highlight the role of university management and multicultural education in an irreversibly interconnected world. The research objectives were related to the testing of the fundamental hypothesis according to which management and culture influence individuals and vice versa. The results showed that the academic management influences the multicultural community, and the relations between its members are always under the sign of change; both technologically and culturally. The conclusions of the research highlight that, first of all, in universities, people and technology influence and blend cultures. Multicultural education removes the barriers to communication and makes people understand others who are different from them. Self-determination is an essential dimension for this interconnected world in which multicultural educated people learn to work in teams (collectivism), learn to tolerate, understand and respect cultures very different from their own. The independence of the educated individual who makes his own decisions implies interdependence and multiculturalism. Culture and education will make the difference between those who understand what academic management in the multicultural world is and those who believe that management is only leadership, privileges and benefits.

Keywords: management, multiculturalism, education

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Introduction

Culture-Education-Management, as a triad of power, is a necessity in an interconnected world. The paper highlights the importance of multicultural education, especially in universities, which means promoting a „nice understanding" between „different" individuals. The purpose of multicultural education in organizations, first of all in education, is to try to bring more social equity to society. Multicultural education begets questions, such as: How can I better communicate with others who are not like me? How can I better understanding others? What can I do for them? How do I become actively involved in changing what I would like to change?

Romania is not known throughout the world as country with a strong economy and a good quality of life; Contrary, Romania is well known as a corrupted country with big troubles like ageing, migration and others. Nowadays, young people are facing to a continuous movement due the technologies and globalization. Many students are studying abroad, many foreign students comes from different countries to study in Romania. The research aimed to highlight the role of academic management in promoting multiculturalism at the University of Medicine and Pharmacy „Grigore T. Popa" Iasi, Romania. Romania. This paper presents several dimensions that characterize multicultural education.

The world we live in is more complex, faster than yesterday and certainly more culturally diverse (Schein, 2004, p. 415). This means that first, in universities people have to become perpetual learners. Multicultural education is a process required in all aspects of universities practices. Universities must have policies enable to ensure the highest levels of academic achievement for all students. Managers are really helped by technology to achieve the basic goal of inter or multicultural education: to inspire respect and equity for everyone, whatever was the basic culture. Human beings lead with emotions that will influence university context – for better or for worse. By learning about neuromanagement, and applying its insights, academic board can manage the ways that emotions influence their community. Neuromanagement will teach people how to increase confidence in organizations. Management involves relationships and these are influenced by the practices of academic leaders who facilitate or inhibit the release of oxytocin, the source of trust. Neurosciences provide insights into managerial practices and behaviors that can directly improve the attachment and indirectly the performance and well-being of the members of the organization (Zak, 2018). Multicultural Education offers answers for questions: How we promote equal opportunities for students from diverse cultural groups? How we build teams with students with different values? Through academic integration and respect for the cultural values of each group of students. Individuals' values and time are essential in the study of a culture. Each individual is influenced by the environment in which he was formed and his behavior in any organization is the result of education, beliefs, prejudices, stereotypes that hallmarked him or not. The research focuses on interactions between individuals representing diverse cultural backgrounds, and explores how such interactions are changing the landscape of education in Romania. Cultural diversity is the opportunity to understand others and to promote more solidarity and equity in our world. Multicultural education help students to develop knowledge, attitudes, and skills needed to participate effectively in the global community.

Literature Review

Managing a culturally diverse academic community means good policies solving important issues, such as equal opportunities to learning and to succcede for each. In a multicultural environment we learn how to develop cooperation for students with diverse life styles, identities, cultures, expectations. A „transformative project" for Banks (1996), a „revolutionary multiculturalism for others "(McLaren and Giroux, 1997), Multicultural Education research from XXI century has pointed to the need to move from superficial to rigorous approach. A representative book edited by OECD (2012, 2015) has defined the multiculturalism as a „political and social agenda that aims to develop a harmonious multiculltural society"(Chiesa, Scott, Hinton, 2012, p.21). This issue is one of the most important for the future of humanity. Multicultural education will be effective (Gorski, 2006; Grant, 2016) only if the aims of equity and social justice will be supported by policies and practices, that lead to institutional transformation. Multicultural education must officially been promoted through national and international policy-making (Holm & Londen, 2010). In universities „a major goal of multicultural education is to help students develop knowledge, attitudes, and skills needed to prticipate effectively in the global community"(Banks, 2015). Despite the different aproaches (conservative, critical, liberal) the multicultural education is a fact theat permeats every nation (Gollnick; Chinn, 2012; McLaren, 1994; 2003; Grant and Sleeter 1987; Webster, 1997; 2007; Banks 2004; 2012, 2015). Multicultural education is begining in school; this is the best place to start a better commmunication between different people. The analysis of culture is particularly important when attempting to manage organization-wide change. Some important studies (Schein, 2010; Hofstede and Minkov, 2010) continue to be an important source of data for cross-cultural researchers. Thus, Hofstede and Schein remain two of the most influential researchers in the field of national and organizational cultures. Hofstede's work has been extended by a very large empirical study conducted by the GLOBE group (House, Hanges, Javidan, Dorfman, & Gupta, 2004) and others (Kimanen; Hummelstedt-Djedou, Zilliacus, Holm, 2018; Mayes,C., Maile Cutri, R., Goslin, N., Montero,F., 2016, Brewer, P. & Venaik, S. 2011; Schwartz, S.H. 2011; Birkinshaw, J, Brannen, M.Y., & Tung, R.L. 2011; Hoyt, 2010; Schein, 2010; Taras, V., Steel, P., & Kirkman, B.L. 2010; Maseland & van Hoorn 2009; Gould, S.J., & Grein, A.F. 2009; Javidan et al. 2006; Chao, G.T. & Moon, H. 2005 etc). The environment is changing and people need to change too.

Research structure

The research was conducted at the University of Medicine and Pharmacy Iasi, considered representative for the Romanian academic environment. Thus, the highest number of foreign students is taught at this university (insee.ro, 2018). At the "Grigore T. Popa" University of Medicine and Pharmacy in Iasi there are more than 2500 foreign students from 80 countries that study here. The research covers the period 2017– 2019 and the sample investigated is made up of 264 students (3-10% from each nationality). The research helps to develop more accurate theories and practical recommendations for management and multicultural education in universities. Despite the difficulties in Romanian education, the managers and members of the academic community promote the right to recognition of difference, and also the right to be included in a resonant environment that values each individual. Cultural diversity in selected university was an advantage and a resource

to promote solidarity and to build a common academic culture. This study is more complex and it has as base an ample research named „Managerial Behavior in Romanian Organizations" (COMOR), made by The Scientific Society of Management from Romania (SSMAR). The research focuses on interactions between individuals representing diverse cultural backgrounds, and explores how such interactions are changing the landscape of education in Romania. This paper presents several dimensions that characterize multicultural education.

Aiming to comply with the specificity of the academic environment as well   to assure a comprability on a international level, the research has been orientated towards identifying the main aspects that characterize the students cultures from the selected university. For the purpose of this paper we have made some adjustments to the Hofstede and Schein methods, regarding the national and organizational culture, and to the Banks method, regarding multicultural education and management. For the collecting of data series, a research has been organized based on the statistic survey among students from different countries that studies in University of Medicine and Pharmacy „Grigore T. Popa" Iasi. The data collected were analysed with the some informatics programs (SPPS). For conclusions we have pertained similar researches, as well as to representative specialty literature For a rigorous research, a questionnaire has been elaborated. It has 80 questions regarding the national and organizational culture and 75 questions that refer to multicultural education. The data collecting and processing have been made between 2017 from present.

The questionnaire

The structure of the questionnaire
  ➢ Identifying the type of respondent
  ➢ Value judgments and/or opinions regarding:
        a) national and organizational culture – 85 questions
              - new beliefs brought in by new members - 14 items
              - social reports - 19 items
              - assertiveness - 14
              - teamwork - 24
              - creativity - 14
        b) multicultural education and management - 75 questions
              - content integration -20
              - equity pedagogy -20
              - the knowledge process-20
              - prejudice reduction - 15
  ➢ Typology of questions:
      - Type of questions: close and open
      - Logic:
              - at first, questions to assess the current situation at the level of the organization, and then questions to assess the desired situation
      - Abstractization degree:
              - concrete (factual) questions
              - abstract questions regarding judgments values, opinions etc.
  ➢ Evaluation scale: The value judgments comprise the entire spectrum of opinions:
              - from highly positive to highly negative

- from total consent to total dissent of something

Qualitative features of the questionnaire:

➢ it ensures the anonymity of the participants and the confidentiality of answers;

➢ voluntary participation to the survey poll and to the answer to all questions;

➢ it contains methodological information so as to guide respondents regarding the content of the questionnaire, the way to fill it in and other orientation information;

Analyzing data:

1. Descriptive (quantitative) analysis of value judgments:

➢ Position indicators: percentages;

➢ Indicators of the central tendency: average, median, module, asymmetry.

2. Factorial (qualitative) analysis, using:

➢ Variation indicators: amplitude of variation, individual deviations, standard deviation, dispersal, variation coefficient;

➢ The calculation of each indicator required a process of converting value judgments into numerical expressions on a Likert-type scale with 5 levels.

➢ The indicators were calculated for each of the two aspects provided to the respondents: the one reflecting current practices (those already existent in the organization) and the one reflecting the desired projection (the one which the respondents consider should be normal in the organization).

The research has defined as target the following:

1. A brief analyzis of and multiculturalism in the selected university
2. To promote the role of academic management into multicultural education
3. Highlighting the need for culturally responsible curricula and policies

At a whole, the research underlines why the triad of power: Culture-Education-Management, is a necessity and not an option.

In order to assure conclusion credibility, from the beginning of the study we have chosen a sample/testing group as representative as possible from the selected academic community. At the "Grigore T. Popa" University of Medicine and Pharmacy in Iasi, 2581 foreign students from 80 countries study.

The sample investigated is made up of 264 foreign students (3-10% from each nationality). The respondents were selected first from top 6 countries with students studying in U.M.F Iasi. Other respondents include students from other countries who have students at the analyzed university.

Table 1: The respondents structure by country and gender

No.	Country	Respondents	Male	Women
1.	France	60	27	33
2.	Israel	60	34	26
3.	Morocco	30	25	5
4.	Greece	24	13	11
5.	Tunisia	25	19	6
6.	Others	65	39	26
	Total 264	264	157	107

Survey respondents structure:
  Gender: males 56,82% and females 43,18%
  Age: 19-27 years

Depending on the language of study, the 8773 students are divided as follows: 1098 study in English, 1218 study in French and 6457 study in Romanian.
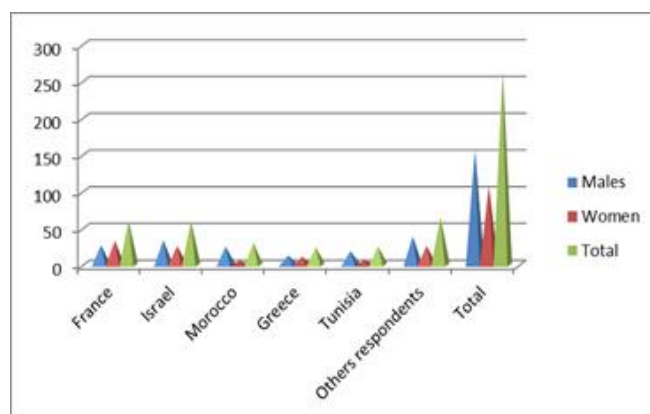
Figure 1: The graphic representation of the observation units

Management and multiculturalism at the "Grigore T. Popa" University of Medicine and Pharmacy Iasi - Findings

The Multiculturalism were identified through these forms: content integration, assertiveness, teamwork, an equity pedagogy, creativity, the knowledge construction process, social reports, new beliefs brought in by new members/leaders, prejudice reduction.

Table 2: Synthesis indicators of the multiculturalism

No. crit.	Form of expression of the cultural dimension; practice of reference (Now, Should be)	0.2	Econometric indicators/markers				
			Average score	Standard deviation	Median	Asymmetry coefficient	Variation coefficient
			$\overline{X}$	σ	Me	C_{as}	v
0	0.1	0.2	1	2	3	4	5
1	Content integration	N	3,85	0,35	4,00	-1,32	9,01%
		Sh	4,00	0,65	4,15	-0,69	16,32%
2	Assertiveness	N	3,48	0,84	3,39	0,34	24,20%
		Sh	3,27	1,12	2,51	2,04	34,35%
3	Teamwork	N	3,03	1,02	3,02	0,01	33,69%
		Sh	3,02	0,91	3,44	-1,38	30,11%
4	Equity pedagogy	N	3,24	0,36	3,27	-0,31	10,99%
		Sh	3,86	0,69	4,24	-1,67	17,94%
5	Creativity	N	3,39	0,63	3,44	-0,23	18,43%
		Sh	3,94	0,41	4,02	-0,60	10,49%
6	The knowledge construction process	N	3,73	0,01	3,73	0,00	0,33%
		Sh	4,23	0,25	4,23	0,00	5,83%
7	Social reports	N	2,89	0,46	2,95	-0,39	15,92%
		Sh	2,66	0,88	2,82	-0,55	33,08%
8	New beliefs brought in by new members/leaders	N	2,31	0,53	2,31	0,00	22,98%
		Sh	2,98	0,94	2,98	0,00	31,43%
9	Prejudice reduction	N	2,79	0,34	2,90	-0,95	12,19%
		Sh	2,45	0,49	2,54	-0,59	20,00%
10	TOTAL	N	3,25	0,46	3,24	0,06	14,30%
		Sh	3,46	0,62	3,27	0,92	17,78%
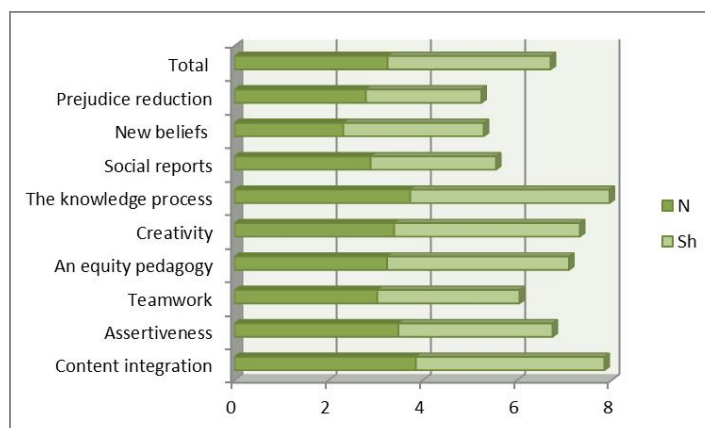
Figure 2: Graphical representation of synthetic indicators for multiculturalism

Content integration

Education incorporates the values, histories, beliefs, and perspectives of people from different cultural backgrounds (3.85 now). Students want more this approach (4-should be). The respondents believe that the content integration must include more activities. Now, this approach is limited to cultural holidays. The implementation of multicultural education requires that the total environment of the university be reformed, including the curriculum and strategies used by teachers.

Assertiveness

"Assertiveness" attained a score of 3.48 for present, meaning that in the organization students are asked to comment upon the decisions of their superiors if they don't agree with them. The score of 3.27 obtained for the desired situation highlights the fact that respondents consider that students don't want to be asked to comment upon the decisions of their superior if they disagree with them. Most of the respondents in the study come from formal cultures. They are used to not commenting on the decisions of the superiors and still want to do so.

Teamwork and social reports

University's position on this dimension is reflected in whether student's image is defined in terms of "I" or "we." A great part of the respondents consider that people in the organization should be a team. Practically, they don't do anything for this. Interpersonal relations are considered as being relatively good and there are no significant differences according to gender. Students share their feelings with group members, are friendly, communicative and care about others. This type of behavior is not desired to be intensified in the future (3.03 now, 3.02-should be).

Equity pedagogy

Most of the respondents consider that equity is best taught when students are involved in authentic work in classrooms (3.24-now; 3.86 should be). University management initiates actions to increase pedagogical equity. There are some optional social and cultural programs for those interested. These programs include intercultural party, lunches, going out for drink or coffee, visiting museums. These actions streamline communication between students and teachers. Students from different cultures feel that the educational process is fair; they feel good in the academic community.

Creativity

Respondents think that the academic environment is conducive to creativity (3.39-now), but they want it even more (3.94 should be). The research has pinpointed the positive link between multicultural experiences and creativity. Students are more receptiveness to ideas and behaviors originated from foreign cultures.

The knowledge construction process

Due the profile of the university selected, there are many activities that require some knowledge construction. Professors ask students to interpret, analyze, synthesize, or

evaluate cases, information or ideas. The research shows that this process needs to be improved (3.73-now; 4.23-should be).

New beliefs brought in by new members/leaders

Academic management offers examples of leaders who know how to convey values (explicitly and implicitly). Management involves relationships and these are influenced by the practices of leaders who facilitate or inhibit trust and commitment in the university organizational culture (score: 2.31-now; 2.98-should be).

Prejudice reduction

Respondents believe that the university offers an environment suitable for students, regardless of the cultures from which they come. Cooperative learning programs are often initiated in the selected university. In the university debates and courses of emotional intelligence are promoted. These have a strong impact on students learning empathy with others and reducing prejudice.

Conclusion

The multicultural university represents the taste of the places in which it is learned, attitudes, the unwritten protocol of interactions and the values of the students, regardless of origin. It is mean everyone's culture.

The study carried out with the help of the respondents' highlights a relative balance between individualistic and collectivist cultures. Students learn to work in teams, be supportive of others, and accept cultural diversity. The paper supports the independence of the educated individual who chooses alone and does not choose others for him. Self-determination, individualism are essential dimensions for this interconnected world, where multicultural educated people learn to work in teams, tolerate and understand behaviors very different from their own. University management takes important steps in promoting multicultural education.

This process implies stability in fundamental values that promote the individual in his beauty and simplicity, but also agility, that is, attention, attraction and real-time reaction to the needs in continuous propagation and diversification of the countless cultures of the world. The limits of the paper are given by the sample size, representativeness, incomplete data and information. However, the research highlights the influence of culture on human behavior, but also the need for multicultural education, which promotes "good understanding" between "different" individuals.

University selected for this research strives to promote multicultural education in an environment that is still inertial and bureaucratic. Management in Romanian state universities mostly neglects the emotional side and organizational culture. The cultural Romanian environment is vitiated with stereotypes and political decisions that contravene the values of the educated individual. Modern society is rather emotional than rational one. Confiding in the group, attachment, subjective motivation, collaboration and not exclusively rational dominance will be the strong parts of managers. The paper is also a discreet warning about the phenomenon created by the failure of Romanian educational policies. Most of the financial resources are allocated

to inefficient, ineffective investments. In the curricula, the number of students often counts first. The management of the state universities tried to survive by eliminating the entrance exams, by introducing the paid education, by attracting students by number and not by value. But, nowadays, science and knowledge can no longer be restricted in universities that are run dissonantly (Goleman, 2007).

In the university analyzed, academic managers takes important steps in promoting multicultural education. This process implies stability in fundamental values that promote the individual in his beauty and simplicity, but also agility, that is attention, attraction and real-time reaction to the needs in continuous change and diversification of the countless cultures of the world. Multiculturalism will encompass digital culture, trust and change. For this we need education and management. And more than all, we need empathy and solidarity. That is, humanity in the most philosophical sense.

The limits of the paper are given by the sample size, representativeness, incomplete data and information.

The multicultural university represents the vibe of the places in which we learn attitudes, skills, and behaviors. It is the protocol of interactions and the values of the students, regardless of origin. The heterogeneity or homogeneity of the societal culture influences the organizational cultures. Many contemporary societies are multicultural even if individuals have different core values, expectations, beliefs depending on education and the environment in which they lived. Romania has a heterogeneous and politically unstable societal culture. The collective culture in Romania, a culture of compromises is not at all homogeneous: the differences are seen by geographical regions, types of organizations, rural or urban environment. The paper has as a case study a university where things are starting to change for the better. In this context, multicultural education can only be extended with appropriate policies, innovative strategies and resonant managers.

The management of the university has proposed the implementation of a multicultural education focused on attention and attraction. The culture of attention inspires commitments because it uses symbols, metaphors, expressions that attract and convince. Heroes, myths and other elements of multiculturalism can convince more than entire pages of rules.

The paper shows that despite the difficulties Romania faces, it exists indications that in universities and other private organizations multicultural education is a requirement and not an option. Time and technology mix cultures and people. Multicultural education will bring us closer to whatever country we come from.

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Machine Learning to Guide STEM Learning: Relative Importance of Social vs. Technical Competencies for STEM Students from Underrepresented Group

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Abstract
Because STEM fields evolve quite rapidly, students interested in STEM professions are often unsure about what will be required of them upon graduation. In addition to specialized skills, such as programming, employers increasingly demand soft-skills, such as communication, self-reflection, conflict management and teamwork. Underrepresented groups in STEM include women, ethnic minorities and students from non-academic families. Academic planning can be more difficult, because they first generation students often lack role models as advisors. On the other hand, as minorities learning to integrate into the majority group, they may have learned to switch roles and see alternative perspectives, which represents a unique advantage to future employers. An analysis of university job market portals could help in career planning. Text mining of job ads enables the extraction of competencies necessary for entry-level positions. A job market portal supported by 15 German universities is analyzed using statistical and machine learning tools: linear regression and neural networks. The analysis of over 22,000 job ads over 14 years enables the identification of specific competencies desired by potential employers in STEM fields. By tracking changes in employer demands, trends can be identified of which skills have become more and less desirable over time. This analysis found that social competencies have become more important. The probable future importance of individual qualifications can be forecast, to help students from underrepresented groups in their academic planning. This work is part of a larger research project to recruit, retain and support STEM students from underrepresented groups.

Keywords: STEM, diversity, soft skills, technical, competencies, machine learning

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Introduction

The digital revolution has permeated all aspects of our modern society. Both low-skilled manufacturing jobs as well as mid-level administrative employees are increasingly being replaced by automation, robotics and artificial intelligence (Bessen 2016). At the same time, industrialized nations are suffering from a shift in demographics due to low birth rates. The number of new graduates in STEM subjects (Science, Technology, Engineering and Math) has not kept up with the increasing demand for qualified professionals. The skills gap between under-qualified job seekers and the increasing number of unfilled positions for highly qualified STEM workers continues to increase (Doerschuk, 2016).

Historically, people from certain demographic groups have been quantitatively under-represented among university graduates in STEM subjects: first generation students, people who come from a migration background, single parents and women.

Instead of viewing digitalization solely as a threat, this research focuses on the advantages which artificial intelligence could bring. This work addresses two research questions:
1. What are the important specialized skills and social competencies graduates in STEM majors need to master for their future careers in a digitalized society?
2. Can machine learning methods be useful in analyzing large quantities of unstructured data about the job market to derive information about which professional competencies will be needed in the near future?

Section 2 Related Work discusses some of the literature about career competencies in STEM subjects. Section 3 Methodology describes the machine learning methods employed in this investigation. Section 4 Results presents the outcomes of these experiments. Section 5 Conclusions discusses the implications of these results for STEM students. Finally, Section 6 presents plans for future research.

Related Work

This section provides an overview of some of the literature related to the current proportion of STEM students from underrepresented groups, their career goals and the competencies which will be required of future graduates in STEM subjects. The complex interplay of language, cultural and gender diversity are also discussed.

First generation students from non-academic households can often be subject to different socialization and cultural norms than students whose parents both have university degrees. Pupils from academic households grow up with access to economic capital, experience geographic mobility and are often socialized to emphasize independence, personal choice and self-expression (Miller 2005). First generation students, in contrast, are often raised to respect cultural norms which encourage interdependence, placing the needs of others before one's own and maintaining strong family bonds. Working-class families frequently suffer from limited economic capital, environmental constraints, with few opportunities for choice, control and influence (Grossmann 2011). Stephens, et al., postulate a theory of "cultural mismatch" (Stephens 2012), which describes cultural obstacles which first generation students encounter as they begin their university studies. Students from

underrepresented groups often perceive themselves as "not belonging". Lack of identification can be a major barrier to underrepresented students participating in STEM subjects (Sinclair 2014). Cross (2001) observed students in a highly competitive engineering degree program, who had not been socialized to act independently and to be self-reliant. These students initially had problems with self-esteem and persistence. These problems could be partially mitigated by high levels of social support among their peers.

A large number of authors have analyzed the effect of gender on attitudes toward STEM subjects in schools and in the workplace. Environmental and cultural influences as well as stereotypical views of STEM subjects can prevent women from entering STEM fields (Blum 2007). According to information from the international PISA study in 2015 (OECD 2016), girls and boys performed similarly on tests of general science literacy in most nations. Although this would imply that boys and girls possess equal innate abilities in STEM subjects, women obtained fewer university degrees than men in STEM disciplines (WEF 2015).

Stoet and Geary found that countries with a high level of gender equality tend to have some of the lowest proportions of women in STEM subjects. Gender equality was measured with the Global Gender Gap Index (WEF, 2015). They call this phenomenon the "education-gender- equality paradox" (Stoet, Geary 2018). They deduced that countries with the highest degree of gender equality tend to be welfare states, with a high level of social security for all of their citizens. Countries with lower gender equality tend to have less economic security and more difficult living conditions. They postulate that individuals in countries with low gender equality would place more value on high paying STEM occupations, which could provide them with economic security. Their analysis suggests that in more gender equal welfare states, the potential financial costs of foregoing a STEM career amplify intra-individual academic strengths. Faulkner (Faulkner 2009) discusses the subtle dynamics which can contribute to a feeling of "belonging" in work relationships. She discusses the importance of informal conversation topics among colleagues, which can make women and other underrepresented groups feel like outsiders.

The intercultural competencies necessary to work in international engineering teams have been investigated by a number of authors. Beecham, et al., (Beecham 2017) identified a number of challenges inherent to working in international development teams, which new STEM graduates will need to address: distance, teamwork, soft issues, stakeholders, infrastructure and distributed development processes. They categorized various types of distances, such as physical (geographic), time zones, cultural, language and institutional distances. Other authors, such as Hoda et al., (Hoda 2016) concentrated on the socio-cultural capabilities which students need to learn to work effectively in globally distributed teams. They pointed out the importance of overcoming language barriers, different perspectives regarding time, attitudes towards achievement, differences in autonomy and work habits as well as assumptions about national culture. They underline the importance of cross-cultural training. One example of the importance of cultural sensitivity in requirements engineering was reported by Hinze, et al. (Hinze 2018). To develop a medical app aimed at improving the health of migrant communities, sensitive medical data needed to be collected. When dealing with multicultural stakeholders, it is of utmost importance to first establish a sense of trust. Ideally, they recommend that one

member of the research team should come from the cultural community studied. This bi-cultural individual can help build to bridges between diverse cultural expectations.

This overview of research demonstrates some of the challenges which students from underrepresented groups will face upon graduation. The question arises as to whether these non-traditional students can leverage their experiences of belonging to minority groups in order to make unique contributions to increase the diversity of perspectives examined when solving innovative problems. Ilumoka (Ilumoka 2012) discusses the importance of diversity in engineering teams. Especially during the requirements engineering phase, nontechnical skills, such as intercultural communication and foreign language abilities, can be of exceptional value for multi-national teams or for stakeholders in foreign countries. During the development phase, cooperation, team-building and conflict management skills can prove vital for the success of an engineering project.

Methods

In order to answer the research questions about which technical and social competencies are most important and to examine whether machine learning methods can be useful in analyzing large amounts of unstructured data from the labor market, it is first crucial to define a pool of test data and then to choose the appropriate analysis methods.

The first step is to define a data pool which contains sufficient information about the labor market and from which it can be deduced which vocational competencies will be needed in the near future. The higher the relevance and the quality of the data, and the better the data preparation before analysis, the more useful the subsequent results of the analysis will be (Mohri, Rostamizadeh, & Talwalkar, 2012, p. 1). Particularly for the first research question, concrete information on competencies is needed. One source of information on competencies required for a particular job can be found in job advertisements. For this reason, the job advertisements of the university career portal database, which contains job advertisements from 2003 onwards, which are used for this research. Since the university job exchange also contains job advertisements for non-STEM occupations, a subset of the data was pre-selected, so that only job advertisements for STEM occupations were considered.

After selecting the appropriate data pool, the next step is to pre-process the data. To be able to perform analyses with a large amount of unstructured data, the data must be available in a certain form. In most cases, the data is never available in a format which can be analyzed directly. Since job advertisements are usually formulated as running text, and required competencies are usually found in unstructured enumerations, the job advertisements must first be subjected to pre-processing. This ensures that the data is available in such a way that a computer algorithm can analyze it. The pre-processing of the data is a lengthy process in and of itself. Thus, from the selection of the data up to the evaluation of the results, it usually requires between 60 and 70 % of the total time expenditure (Maurer, 2019, p. 108).

In order to answer the question about which technical and social competences are most important, a list of all the competences in question from the job advertisements must be available, as well as an indication of how often these competencies were

mentioned in total. This allows for an assessment of how important a single competency is across the multitude of job advertisements.

The second research question on the competencies needed in the near future requires a slightly different data structure. Since this requires a prognosis, time series have to be used. It has to be calculated how often a competence occurred in each year in the past.

The processing of the data starts with tokenizing. In tokenizing, the words and punctuation marks are separated from each other, so that each word and each character can be considered independently. All characters and numbers that are not alphanumeric and the so-called "stop words" (e.g. filler words such as "der", "die", "das") are then removed from these words. Some of the remaining words can then be further ruled out. In the case of job advertisements, for example, company names can be removed from the advertisements, because they are not relevant for the identification of requirements.

Parallel to the pre-processing of the data, "dictionaries" must also be created, which contain as complete a scope of all of the competencies as possible. The competencies from the dictionaries are then individually combined with the words from the job advertisements. If it is recognized that a word from the job advertisements is equal to a word from the dictionary, it is marked. This, however, carries the risk of redundancies, e.g. due to different conjugations used for a word in the job advertisements. In order to avoid redundancies, both the words in the job advertisements and the words in the dictionaries are stemmed. Stemming means reducing a word to its root. After stemming the words, the actual information extraction can take place, on the basis of which the analysis can then take place.

In order to obtain as good and usable analysis results as possible, a lot of historical data is required. (Mohri et al., 2012, p. 1). It is also necessary to use the same number of data records every year. Since this work is based on the number of occurrences of a competency, a different number of data sets per year would falsify the result. The years 2003 and 2004 from the career services database, for example, have less than 100 data sets, while some years from 2005 onwards include approximately 10.000 data sets. For this reason, only the years 2005 to 2018 were used in this analysis.

	year	occurrence	competence	type of competence					
0	2018	1114	Erfahrung	0	**1791**	2011	1	Adobe	0
1	2017	1029	Erfahrung	0	**1792**	2009	1	Adobe	0
2	2013	967	Erfahrung	0	**1793**	2007	1	Adobe	0
3	2015	956	Erfahrung	0	**1794**	2013	1	umweltbewusst	1
4	2014	956	Erfahrung	0	**1795**	2017	1	tolerant	2

Figure 1: Results of the data processing

Figure 1 shows an example of the data used to identify competencies needed in the near future. It is a list of all competencies included in the job advertisements. This list is enriched by information on how often they are mentioned and in what year. The example in Figure 1 shows that the competency "Erfahrung" (experience) was requested in the years 2018, 2017, 2013, 2015 and 2014, with the corresponding frequencies listed in the first column. In order to show that other competences were also mentioned in the job advertisements, lines 1791 to 1795 show further entries in

the list. An aggregation of the list per competency enables the determination of which technical and social competencies were important for STEM majors.

However, the presentation of the data in Figure 1 is not yet suitable for answering research question two, namely whether machine learning methods can be useful to analyze large amounts of unstructured data from the labor market. Mitchell describes machine learning as suitable for analyzing large amounts of data and generating knowledge from the data that is not yet available (Mitchell, 2010, p. 14). But it is not enough to know that new knowledge can be generated. It is also important to be able to assess whether the models can deliver meaningful results. Therefore, two different models will be tested. The results of both analyses should then be compared with each other in order to be able to make a statement about the functionality of the models. The machine-learning models are to provide forecasts for the years 2017 and 2018 on a trial basis, so that these can be compared with the actual figures from the list in Figure 1.

Each model must first be fed with training data for analysis, so that the algorithm can learn from it. This procedure is called "training," because the machine learning models become better and better through the training data by adapting themselves to the data available (Mitchell, 2010, p. 17). This is how new knowledge can be generated from current data (Müller & Guido, 2017, p. 123). After training the respective model, the forecast figures for the years 2017 and 2018 are to be provided. This data, which is used to check the model's functionality, is called test data. A comparison with the actual figures from 2017 and 2018 now makes it possible to assess the functionality of the models.

When training a machine learning model, it is important to use as much training data as possible, because the more training data you use, the more accurate the prediction result will be. Therefore, the years 2005 to 2016 are the training data and the years 2017 and 2018 are the test data. The model that provides the better forecast data is then used for the actual forecast that provides information about skills needed in the near future.

Now that the procedure for evaluating the models has been determined, two machine learning models are next selected for comparison. The first model selected is linear regression, a classical machine learning model. Linear regression is a machine learning model that mathematically investigates the relationship between two characteristics (Teschl & Teschl, 2007, p. 215) and uses this mathematical correlation to predict future values. One characteristic is dependent on the other (Raschka, Mirjalili, & Lorenzen, 2018, p. 317). In the case of job advertisements, the number of requests depends on the year in which they were made. Linear regression is a method of supervised learning which calculates continuous values using a regression line (Raschka et al., 2018, p. 317). The future values can be read off from the regression line. Since linear regression is a model that provides continuous values, the years 2005 to 2016 can be used as training data without further adjustments. The years 2017 and 2018 can be used as test data. The regression line resulting from the training and test data can be used to read the forecast data and compare it with the test data.

The second method selected for evaluation is a neural network, which calculates future values on the basis of an algorithm. The recognition of correlations requires the

use of multi-layered neural networks. A neural network consists of neurons that work in parallel and send information to each other via directed connections (Kruse et al., 2015, p. 13). The algorithm is fed with input values and the subsequent output values are calculated by layers and different weightings of the neurons. In order to generate meaningful results, neural networks must be trained. This means that the neural network is fed with input values. The network then back-propogates during the execution of the algorithm to check whether the results are valid. If these are not valid, the algorithm adapts to provide better results. Once the network is trained, it can be used to make the actual predictions. Since the neural network learns iteratively and uses data from previous years, the net must be trained somewhat differently than a linear regression model. More specifically, this means that for the neural network the years 2005 to 2014, and parallel to this, the years 2006 to 2015, each one year later, must be used as input values. The years 2016 and 2017, and 2017 and 2018 respectively, then serve to verify the forecast values by the neural network.

Figure 2 below illustrates the distribution of test and training data for the neural network. It can be seen that both the training data and the test data are offset by one year so that the algorithm can learn.

year	training data X	training data y	test data x	test data y
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				
2013				
2014				
2015				
2016				
2017				
2018				

Figure 2: Partitioning of the training and test data for the neural network

After both the regression model and the neural network models have been executed, the forecast values for 2017 and 2018 are compared with the actual available values. The selection is made on the basis of the percentage difference between the two values, so that the better machine learning model is used for the actual forecast for the near future.

Results

Figure 3 shows an example of the result of the first analysis for selecting a machine learning model. The left side of Figure 3 shows the result of the linear regression, the right side shows the result of the neural network. Both diagrams are based on the

performance of the competence analysis "independently". The green dots are the actual figures, the black dots the forecast figures for the years 2017 and 2018. Figure 3 shows that for the competence "independent" the neural network worked better than the linear regression. A total of 12 analyses per machine learning model were carried out to select the appropriate model. The evaluation of the 24 analysis results per model (12 each for the years 2017 and 2018) showed that the neural network delivered better results in 18 of 24 cases, which is why the neural network was used to forecast future competences.

Linear Regression   Neural Network
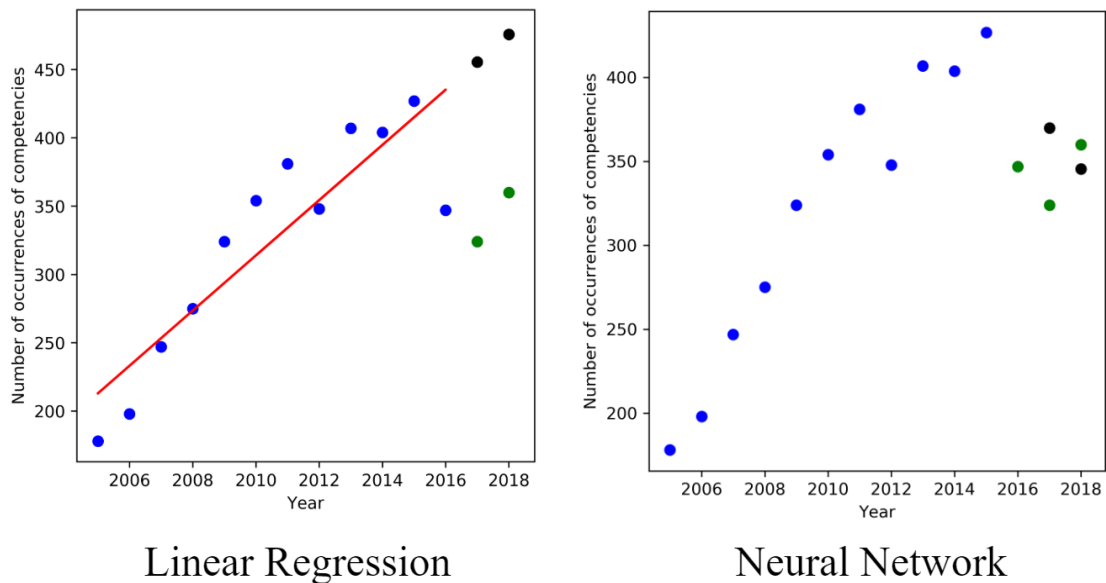
Figure 3:Example of the prediction for the competence "independence"

First of all, when presenting the results, one should answer the research question:
1. What are the important specialized skills and social competencies that STEM graduates need for their future careers in a digital society?

Specialized Skills		Social Competencies	
Experience	12,200	Ability to work in teams	5,214
University Degree	9,199	Self-reliance	4,574
Excel	3,731	Analytical abilities	3,060
English	2,781	Commitment	2,882

Table 1: Most important specialized and social competencies

Table 1 shows the four most important specialized skills and social competencies that STEM graduates should master in their future careers. The most commonly requested specialized skill is the experience that graduates should bring with them. However, this must be viewed with caution. Especially graduates from underrepresented groups often do not have time to work part-time to gain work experience during their studies. In particular, students from non-academic families have to deal intensively with

everyday student life and cannot expect the same support from home as students from academic families. Gaining work experience is of secondary importance to their studies. As this is an analysis for graduates from STEM courses, all students can demonstrate this technical competence. Specialized skills in Excel comes in a distant third. The mastery of Excel cannot be completely guaranteed by STEM majors. However, Excel is often used as a tool, so at least the basics are taught. The fourth specialized skill identified as one of the most important is English as a second language. For STEM graduates at the TH Nuremberg in Germany, this is a skill which should be readily mastered, as there are two English lectures in the bachelor's degree program and even a third in the master's degree program.

The most important social skills are led by the ability to work in a team, followed by self-reliance. These two competencies are promoted by learning methods in which group work is often carried out during courses and a lot of independence is expected in order to obtain the academic title. The third most important social competency is analytical ability. This competence is promoted in courses such as "Software Engineering", where, for example, customer requirements have to be analyzed and structured. The final important competency listed for a future career in a digital society is commitment. However, this does not say anything about the extent to which these competencies are pronounced among the students. This aspect will be further discussed in the conclusions.

After the identification of the most important specialized skills and social competences, the second research question can now be answered:
2. Can machine learning methods be useful to analyze large amounts of unstructured data from the labor market in order to derive information on which vocational competencies will be needed in the near future?

The answer to this research question was initially preceded by general analyses.

Figure 4 below shows a diagram of the number of occurrences of competencies, broken down by year. The graph shows that the number of different competencies has increased by about 20 since 2005. Since 2007, the number of different competencies has fluctuated between approx. 125 and approx. 137. In principle, the diagram in Figure 4 shows that the required range of different competencies has increased since 2005 and has fluctuated since then. However, until 2018, the number of different competencies required has not exceeded 135.
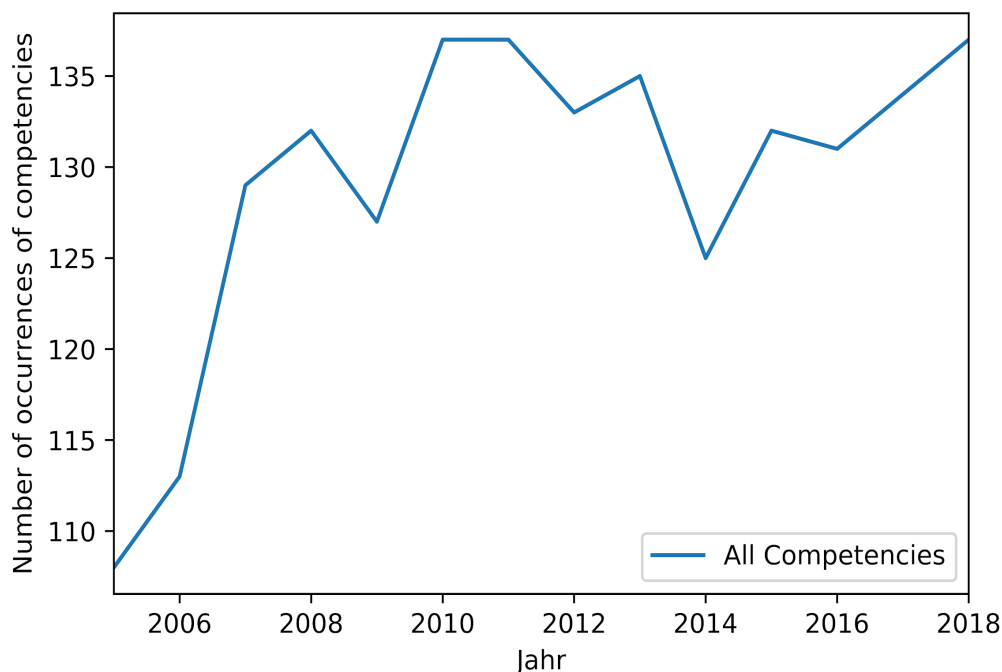
Figure 4: Analysis of the number of competencies pro year (Maurer, 2019, p. 62)
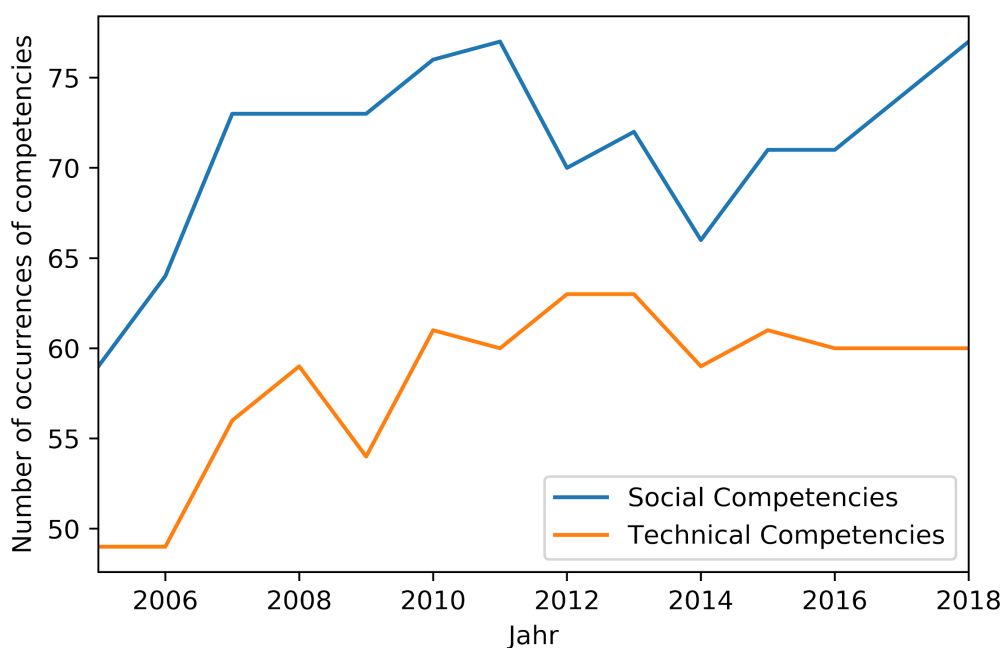
Figure 5: Comparison of social competencies vs. specialized skills (Maurer, 2019, p. 64)

In addition to the total number of competencies in Figure 4, Figure 5 shows a comparison of the number of technical and social competencies. The upper line shows the number of social competencies, the lower line the number of technical competencies. It can be seen that already at the beginning of the data series in 2005,

the required number of social competencies is higher than that of technical competencies. This continues until 2018. In addition, it can be seen that the demand for technical competencies has apparently stagnated since 2016. In contrast, the demand social competencies has been rising steadily since 2016. At the same time, the trend in the variation of social skills required continues to rise.

Looking at the diagrams in Figures 4 and 5, it can therefore be said that social skills have become increasingly more important in the occupational environment than technical skills. This is underlined in particular by the available data, since it concerns data on STEM occupations, i.e. exclusively technical and scientific occupations. The assumption made by society that only technical know-how counts in technical occupations was refuted by Figure 5 above. In particular, this also has an advantage for underrepresented groups. Technical skills can be learned, while soft skills are often difficult to acquire. Since students from underrepresented groups have often had to master a large number of soft skills in the course of their lives, e.g. for integration into majority groups, there is a potential advantage here. The know-how for technical competencies can then be acquired during an intensive learning process.

	Experience	University Degree	Excel	English
Occurrences 2018	1114	801	207	170
Forecast 2020	1201	838	195	164
	Teamwork	Communication	Networking	Cooperation
Occurrences 2018	359	105	14	5
Forecast 2020	358	101	11	5
	Self-Reliance	Analytical Abilities	Commitment	Proactive
Occurrences 2018	360	207	177	212
Forecast 2020	379	205	173	219

Table 2: Forecast for 2020 in comparison to actual occurrences in 2018

In addition to the general analyses, the forecast for the near future for the required vocational competencies will now be presented. The machine learning algorithms were trained in such a way that they provided forecasts for the year 2020. Table 2 presents the concrete forecast figures for 2020, compared to the figures already available from 2018 and shows the result of the forecasts for the year 2020. Since the machine learning algorithms used here can only be executed for one competency at a time, 12 competencies were selected for which a future forecast should be prepared (Maurer, 2019, p. 66). Table 2 above shows that two of the subject-specific competencies, namely "experience" and "degree", are becoming more important, while the "Excel" and "English" competencies are less required. In the area of social competencies, the forecast shows that expectations will not change for the competency "cooperation", but that demand for the competencies "ability to work in a team," "communication" and "networking" will decrease. The results for personal competencies are similar to those for technical competencies. The two competencies

"self-reliance" and "proactive" are forecast to experience an increase in demand, while the competencies "analytical ability" and "commitment" should be slightly less in demand. In summary, the concrete forecasts for the 12 competencies show that two technical competencies are becoming more important and two less important. On the other hand, five of the eight soft skills will be less in demand, while one remains the same and two will be more in demand. The figures from Table 2 contradict the tendencies from the diagrams in Figure 4 and Figure 5. However, it should be noted that only 12 of the 135 different competencies identified were considered and thus no reliable result can delivered based on Table 2.

Competence	Forecast
Experience	1,201
University degree	838
Self-reliance	379
Teamwork	358
Proactive	219
Analytical ability	205
Excel	195
Commitment	173
English	164
Communication	101
Networking	11
Cooperation	5

Table 3: Necessary competencies in the near future

Table 3 above provides the concrete answer to research question two. Specifically, experience and study will continue to be required. However, independence and the ability to work in a team will also be useful in the future. In addition, personal initiative is welcome, followed closely by analytical skills. However, classical skills in Excel and commitment will continue to be important. As globalization continues to progress, English skills and communication skills are also important. Good networking will also be required. Finally, graduates seeking their first entry-level jobs should show a high level of cooperation.

Conclusions and Future Work

In conclusion, this study has been able to answer two research questions:
1. What are the important technical and social competencies graduates in STEM majors need to master for their future careers in a digitalized society?

The most widely sought technical skills were: work experience, a university degree, proficiency in Excel and proficiency in English as a second language. The most widely sought soft skills were: ability to work in teams, self-reliance, analytical abilities and commitment.

2. Can machine learning methods be useful in analyzing large quantities of unstructured data about the job market to derive information about which professional competencies will be needed in the near future?

Machine learning methods have shown to be useful in analyzing large amounts of unstructured data on the labor market. The machine learning methods forecast the following professional competencies as important in the near future: work experience, a university degree, self-reliance, ability to work in teams, proactive, analytical ability.

These results leads to a future research question: To what extent can students from under-represented groups fulfill these competencies? Underrepresented groups may have an advantage in acquiring these soft skills. Especially students from underrepresented groups often have to develop self-reliance, as they may study at a university far away from home and may therefore be more independent than the average student. In order to integrate into a culturally foreign environment, not only a great deal of communication talent and commitment, but also personal initiative is required. This could enable first generation students, students with a migration background, single parents or women in STEM to develop higher levels of social competency.

This work is part of a larger research project, named "DiaMINT". The goal of the project is to recruit, support and retain students from underrepresented groups in STEM subjects. DiaMINT covers each phase of the student customer journey, from the initial information gathering phase, through application, admission, orientation, internships, exams, theses and entry into the job market (Schuhbauer 2019).

Acknowledgements

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Professional Development for Teaching Online and Hybrid Courses in Higher Education

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Abstract

All institutions want their faculty to have confidence going into a classroom to teach their subject, whether face-to-face classes, hybrid classes that are partially online, or fully online classes. How can institutions support their faculty to be effective and independent in the classroom teaching hybrid and online courses? This talk will walk through the suite of professional development opportunities available to faculty for teaching online at the University of Virginia (UVA). There is a range of options from self-service, just-in-time summary sheets to immersive cohort based residential workshops. I will illustrate the resources that have been developed which include: Screencasting 101, Accessibility 101, and Converting Your Course to be Online. I will also walk through the self-paced six-week online course that is available for teaching faculty best practices for teaching online. I will walk through the syllabus and materials for our face-to-face residential workshop called the Course Design Institute. Finally, I will discuss the idea of having a selective teaching fellows program which is based on available, free content but is delivered to a cohort over an academic year with high perceived value for faculty.

Keywords: Professional Development, Faculty Development, Just-In-Time Training, On Demand Training, Training, Teaching, Teaching Online, Hybrid

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Introduction

All institutions want their faculty to have confidence going into a classroom to teach their subject, whether face-to-face classes, hybrid classes that are partially online, or fully online classes. How can institutions support their faculty to be effective and independent in the classroom teaching hybrid and online courses?

This paper reviews the suite of professional development opportunities available to faculty for teaching online at the University of Virginia (UVA). There are a range of options from self-service, just-in-time summary sheets to immersive cohort based residential workshops. This paper includes illustrations of the following resources: Screencasting 101, Accessibility 101, and Converting Your Course to be Online. Data on usage of these resources is also included.

UVA was established in 1819 and is a public, research focused university in Charlottesville, Virginia. UVA and Thomas Jefferson's homestead of Monticello are a UNESCO World Heritage site. UVA has thirteen schools (medicine, law, data science, etc.…) with approximately 25,000 students. The largest school at UVA is the College of Arts and Sciences. The majority of students are 18-22 years old and attend face-to-face classes for their degree program in Charlottesville.

Several schools have online programs that are central to their mission and strategy. There are 17 online degree programs, 18 online certificate programs, and hundreds of online courses available at the University. The University is also a partner with the massive open online course (MOOC) provider, Coursera. There are 49 MOOCs and 4 million MOOC learners who have enrolled in UVA's MOOCs on Coursera. All online programs at the University are on the http://online.virginia.edu website.

Supporting faculty with teaching and providing an exceptional student experience are priorities of the University. To support faculty, resources have been developed through the Center for Teaching Excellence (CTE). These resources range from self-serve one-page toolkits to cohort-based certificate programs. The range of professional development opportunities include self-serve toolkits, pop up support, webinars, conferences, book clubs, workshops, and certificate programs. The University is assessing opportunities to support faculty teaching hybrid and online classes and is always open to feedback for how to serve faculty and students.

Self-Serve One-Page Toolkits

Self-serve one-page toolkits were added to the CTE website in September 2019. The idea with creating self-serve resources is that society today is increasingly on-demand. People want to find information at their fingertips when they need it on their smart device (Shubina and Kulakli, 2019). These toolkits are advertised to faculty in a quarterly newsletter from the CTE. In the fourth quarter of 2019 there were 419 downloads and 1,162-page views of these resources. These one-page toolkits include: Active Learning (Figure 1), Converting Your Face-to-Face Class (Figure 2), Digital Content Accessibility (Figure 3), Quality in Online Learning (Figure 4), Screencasting 101 (Figure 5), UVA Resources for Teaching Online (Figure 6), and Open Educational Resources (Figure 7).

10 Tips for Engaging and Active Learning

UNIVERSITY of VIRGINIA

Are you ready to move from 'sage on the stage' to 'guide on the side?' There has been much research and press about active learning. When you start making online materials for your class, there is a great opportunity to redesign the face to face learning experience for students to use higher level cognitive skills. Here are some techniques to consider.

10 Techniques for Engaging, Active Classrooms

1) The One-Minute Paper encourages students to reflect on material, clarify what is important and raise questions. This technique is when the instructor poses an open-ended question and gives students one minute to write down their answer.
2) Muddiest or Clearest Point is a variation of the one-minute paper where you are asking students to write about what they do or don't understand from the lecture.
3) Think-Pair-Share is when you divide the class into smaller groups, have them work through an activity, and then share back to the class.
4) Student as Teacher is when students teach the topic. For example, you could have students watch a video lecture and then have a student teach the main ideas from that lecture or have students write the quiz/test questions. A variation is to have students evaluate each other, peer to peer, using rubrics provided by the instructor.
5) The fishbowl is a technique where students are asked to write down one question from the material that they do not understand and put that into a bowl as they come to class. Then the instructor pulls out a few questions and answers them during the class.
6) Finger or index card signals is a technique where you poll the class for a question. For example, students hold up green or red index cards to represent yes or no when responding to a question and then the instructor (or student) talks through the correct answer. Poll Anywhere is a common app for this and clickers are common tools.
7) Puzzles, case studies, and project-based learning are techniques where a student works through specific examples to try and understand the main concepts and alternate theories. An example is when an illustration is shown with something missing and students need to figure out what is missing, what that thing does, and what happens when it is missing.
8) An active review session is a technique where the instructor poses questions to students in groups where they can work through and find answers together.
9) Concept maps and lists can be used to illustrate and compare ideas. This can be done individually, in groups or instructor led.
10) Panel discussions and debates get students engaged and active in class. Students represent different viewpoints and answer questions from a moderator.

References and Additional Resources:
Cal State LA Active Learning in the Classroom
University of Florida Active Learning Tools
Todd Finley's Handy One-Page Infographic for Active Learning Strategies

Figure 1: Active Learning One-Page Self-Serve Toolkit.

10 Tips for Converting Your Face-to-Face Class to a Blended/Hybrid/Flipped Class

UNIVERSITY of VIRGINIA

In blended (aka flipped or hybrid) classes, instructors use the face-to-face time for engagement and activities rather than lecturing. Typically, instructors create or curate online learning materials for review outside of class. For some tips, see the 10 Tips for Engaging and Active Learning.

10 Tips to Create Successful Blended Classes

1) Mind the time commitment. Shifting to a blended model requires abundant planning. Set yourself up for success by scheduling time and resources to support the shift.
2) Mind the time commitment for your students. Shift the workload for the students between their in-class and out-of-class work without increasing the overall workload.
3) Review your course content separating what can be reviewed outside of class versus face to face. For example, filming a physics demonstration and then doing an in-class activity where different groups think-pair-share real-world examples of that law in action.
4) Target online content, whether created or curated, to be in 4-8-minute segments with clear audio and transcripts.
5) Use the Screencasting 101 resource for tools to create online content.
6) Need help with transcripts? Check out Do-It-Yourself Captioning (UVA Library) which includes vendors and DIY transcripts and captions for YouTube.
7) Save yourself time in the future and create 'evergreen' videos. Evergreen videos have no reference to dates or current events and can be used year after year with minimal editing.
8) Provide an incentive for students to prepare for class and a way to assess their understanding such as a short quiz, a writing activity, or a worksheet.
9) Plan student engagement during face-to-face class time with activities that develop higher level cognitive skills (understanding, applying, analyzing, evaluating, and creating).
10) Use the template below to plan your in-class and out-of-class activities.

Blended Class Syllabus Planning Template

Week 1			
Learning Outcomes:			
Out of Class		In Class	
Activity:	Assessment:	Activity:	Assessment:

Additional Resources:
Coursera Field Guide to Flipped Learning with common mistakes and how to fix them
Knewton infographic explaining the flipped classroom: what, why, 'results'
OLC Institute Diigo curated set of articles on "flipped learning"
Vanderbilt's Center for Teaching Guide to Flipping the Classroom

August 2019 Version 1.0 For questions, please contact Dr. Kristin Palmer at kristin@virginia.edu or 434-260-4685.

Figure 2: Converting Your Face-to-Face Class

Accessibility for Digital Content

Have you ever used the ramps on sidewalk corners? These are an example of how a design to make something more accessible can be utilized to provide benefit for everyone. Accessibility became part of federal law with Section 504 of the Rehabilitation Act of 1973 and then the Americans with Disabilities Act of 1990. Additional amendments were passed in 2008. Accommodations and universal design (design of products and environments to be used by all people without the need for adaption) are used to improve access to content.

10 Steps to Accessible Digital Content
1) Use clear and consistent layouts, avoid background colors
2) Use styles when creating materials (heading, bulleted list, etc..)
3) Use descriptive language for links, no "click here" or long URLs
4) Use concise alternative text to describe images and tables
5) When using video, audio and image quality is clear and file size is reasonable
6) Caption or transcribe video and audio, see Do-It-Yourself Captioning at UVA Library
7) Use serif fonts in black on a white background, use consistent fonts throughout materials
8) Avoid overuse of underlining words, CAPS, **bold**, *italics*, and animated or blinking graphics
9) Read through the NCDAE cheatsheet for application(s) you use often
10) Include the UVA Statement on Accessibility, UVA Accessibility website, and Report a Barrier on your syllabus and explain these resources to students.

UVA Statement on Accessibility:
The University of Virginia values disability within the spectrum of human diversity and is committed to living, learning, and work environments where individuals with disabilities can be their full selves and thrive. The University recognizes that ensuring equal access to educational, employment, and all other opportunities is a shared responsibility that demands our continuous identification and removal of physical, technological, and attitudinal barriers.

Additional Resources:
- Cheatsheets - here are 1-page printouts for common applications such as PDF, Word, and PowerPoint provided by the National Center on Disability and Access to Education (NCDAE)
- Step-by step guide to creating and editing transcripts on YouTube.
- Tutorials by application from Michigan State including Google Drive
- PCC guides by for accessibility checking, handbooks and one-page guides by application
- Posters and simple do/don't checklists by impairment
- Recommendations by Sheryl Burgstahler for ADA Compliance for Online Course Design
- Non-technology related accommodations for students with disabilities
- Web Content Accessibility Guidelines (WCAG) 2.0
- WebAIM resources including how to make a PDF document accessible
- UVA's Corporate Accessibility Questionnaire for vendors

Figure 3: Digital Content Accessibility

Quality in Online Learning

There is no institution-level quality standard for evaluating the quality of hybrid courses, online courses or online programs at the University. The University does have memberships to several organizations that publish quality standards. There are some Schools with School-based quality standards for online.

In general, it is a best practice to adopt one quality standard and then assess your content on a routine basis with that quality standard. It is typical to evaluate a course at launch for a quality score and then to update materials after the first iteration of teaching the course. It is a best practice to completely refresh course materials to ensure accuracy and timeliness every three years. The links below are hosted in COLLAB.

Additionally, both the Online Learning Consortium (OLC) and Quality Matters (QM) offer training and consulting around quality. Trainings provide an overview of the rubrics, certification for a specific rubric, or train the trainer certification for a specific rubric. Consulting services include evaluating current programs and advising for future programs.

Quality Standards with Rubrics
1) The three most widely used and recognized quality rubrics are: OLC Quality Course Teaching and Instructional Practice (QCTIP), QM Course Design Rubric Standards, Open SUNY Course Quality Review (OSCQR)
2) SCPS Course Design Rubric and SCPS Expectations for Online Classes
3) OLC Quality Scorecard Suite: Administration of Online Programs, Blended Learning Programs, Quality Course Teaching and Instructional Practice (QCTIP), Digital Courseware Instructional Practice, and Quality Scorecard for Online Student Support.
4) QM Course Design Rubric Standards and QM Professional Education Rubric
5) Open SUNY Course Quality Review (OSCQR)
6) One page handout from the University of Wisconsin on Online Course Quality Indicators
7) ONE Standard for Quality Online Teaching
8) UVA Digital Content Advisory Committee (DCAC) Checklist for ADA Compliance
9) 2017 Blackboard Exemplary Course Program Rubric
10) AECT Instructional Design Standards for Distance Learning with sample rubrics

Figure 4: Quality in Online Learning

Screencasting 101

Screencasting, also known as screen capture, is a method to quickly show students content from your desktop by recording, editing and sharing videos. There are numerous free tools available such as Screencast-o-matic (easy-to-use, free), OBS Studio (open source, many features), Kaltura (embedded in COLLAB), Screencastify, Filmora, Jing and Panopto. Tricks to screencasting are to keep videos short, concise, and "evergreen." Evergreen means you record your videos without reference to current events, dates or seasons so that you can reuse the same video in the future without having to edit. Screencasts can be uploaded to any number of hosting sites such as Box, Google Drive, COLLAB, or YouTube.

10 Steps to Successful Screen Capture Videos
1) Create an outline, storyboards can be helpful (see sample below)
2) Decide on screencasting software, screencast-o-matic is easy-to-use and free
3) Record in a quiet environment (sound studio available at Clemons Library)
4) Close out all other apps and tabs, declutter your desktop, turn off alerts and reminders
5) Open up all the tools and documents you will use in your video
6) Target 3-8 minute videos with excellent audio (microphones available at Clemons library)
7) Summarize what you are covering in the video at the beginning and again at the end
8) Be yourself, speak naturally, tell your story
9) Edit/trim video to keep it short and take out any errors or pauses
10) Create a transcript (see Do-It-Yourself Captioning on UVA Library site)

Sample Storyboard:

Title:

SHOW	TELL
Instructor video cam	Summarize what will be covered in the video, timeline for semester with syllabus as reference
Word doc syllabus, scrolling	Talk to each week of the course and what will be covered and due
Instructor video cam	Summarize that there are x assignments due on Y dates and information can be found on the syllabus

Additional Resources:
- Discovery Education, Screen casting for educators includes research on efficacy of tools, how to record, and extensive list of tools for storyboarding and recording content
- Educause Review, Screencasting to Engage Learners, tips and extensive lists of tools
- Here is a sample screencast by Vincent Racaniello who teaches virology at Columbia explaining how to use Screen Flow with products he uses to record his lectures and slides.

Figure 5: Screencasting 101

University Resources for Teaching Online

The Great and Good Strategic Plan 2030 highlights teaching in the 21st century and supporting teaching and learning in different modalities. If you are interested in creating digital assets for your course or converting parts of your course to be online, whether synchronous or asynchronous, there are resources to support you.

10 University Resources for Teaching Online
1) Communities of Practice (CoP)for Instructional design and online teaching and learning: These CoP have members across the University, COLLAB sites with lots of resources and email listservs.
2) Media Studios: Looking for somewhere to film content that is quiet with good lighting and expertise close by? There are media studios open to all at Clemons Library and the Claude Moore Health Library. Additionally, there are School-based resources for faculty in those Schools at the College, Curry, Darden, McIntire, Medicine, SCPS, and SEAS.
3) Sound Studios: there are sound studios available to be used in at Clemons Library and the Claude Moore Health Library. Additionally, School-based resources are also available.
4) Equipment: Equipment is available to rent at Clemons Library. Training may be required.
5) Professional Development: Are you interested in learning more about teaching with technology? There are self-paced resource sheets, self-paced online courses, a self-paced online class How to Teach Online, and online workshops through the Online Learning Consortium (OLC) and Quality Matters (QM). The workshops are usually for one week with mostly asynchronous materials.
6) Events: The University hosts two events annually, the Teaching with Technology Fair in October and the Innovation in Pedagogy Summit in May. These events are opportunities to network with peers and learn about different projects across Grounds.
7) Software: ITS Software Gateway lists the institutional licensed software products. Zoom is licensed by the University. Other tools such as Screencast-O-Matic are free tools that are not centrally managed. Please make sure any tool you use with students is accessible.
8) Platforms: The institutional learning management system (LMS) is COLLAB. Several schools use different LMS solutions with most online programs using CANVAS. Coursera is the institutional platform for massive open online courses (MOOCs).
9) Committees: Teaching and Learning with Technology Committee (TLT) and the Online Learning Advisory Committee (OLA) provide support for online and hybrid learning.
10) Institutional Memberships: Regional memberships include the Instructional Development Educational Alliance Exchange (IDEAx) which is focused on instructional design and Networked Learning Collaborative of Virginia (NLCVa) which is a network of 13 institutions in Virginia. NLCVa meets monthly and does provide scholarships for events and training related to online learning. National memberships include the OLC, QM, UPCEA and Educause. For any of these national organizations, you can sign up for events, news, and professional development at a discounted member rate.

Figure 6: UVA Resources for Teaching Online

Open Educational Resources: What Are They and Where to Find Them

"Open educational resources (OER) are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others." - William & Flora Hewlett Foundation

OER are freely available under a Creative Commons license for faculty and students to be able to retain, reuse, revise, remix, and redistribute the content. The benefits of using OER include reducing the cost of course materials, adapting course materials to meet specific needs, and practicing active and inclusive pedagogy.

OER take many different forms, including syllabi, course modules, textbooks, videos, tests, notes, lab manuals, journal articles, and assessment tools. Authored primarily by faculty, they originate in colleges, universities, libraries, government agencies, and publishers.

To find Open Educational Resources for your courses:
1. Consult with your liaison librarian.
2. Visit the Library's subject guide on OER for a general overview and links to search engines.
3. Search for relevant content:
   a. The VIVA Faculty Textbook Portal contains 200,000 titles form VIVA's shared library collections of low-cost or no-cost options for students.
   b. OER Commons includes links to OER and guidance in creating your own.
   c. MERLOT also includes content and tools.
   d. OASIS currently searches content from 64 different sources.
   e. The Mason OER Metafinder searches across a wide range of material types.
4. For textbook-specific content, try:
   a. The Open Textbook Library includes open textbooks and reviews from faculty across the nation.
   b. OpenStax has a selection of textbooks aimed toward large enrollment courses.
   c. BCcampus Open Education offers a collection of hundreds of open textbooks created by faculty at institutions in British Columbia.

You'll see duplicate hits in many of these engines, but each one has a different approach to discovering and presenting information, and most pull in at least some unique content. If you need help using OER in your class or creating your own OER, contact UVA Library's Director of Faculty Programs Judith Thomas for assistance or a referral.

Compensation will soon be available for textbook reviewers. As of spring 2020, a $200.00 stipend will be available for reviewers of textbooks from The Open Textbook Library. Please contact Judith Thomas for questions about this program.

Figure 7: Open Educational Resources

Pop Up Support

One faculty support option that is being considered is pop up support. Colleagues at the Oregon Health and Science University (OHSU) presented their findings at the NWeLearn conference (Bailey, Forester, & Forney, 2019). These colleagues found that they would coordinate webinars, training sessions, and workshops that were topics the faculty requested but faculty would not show up to these sessions. They found that when they would set-up a conference table outside of faculty events for faculty attendees to stop by and ask the experts. The University hosts two annual conferences related to technology and innovation which are detailed later in this paper. Setting up a pop-up conference table with an ask the experts reference for using technology in your classroom may be successful for supporting faculty.

Webinars and Short In-Person Training Sessions

Our University has had success with participation of faculty in short training sessions that cover topics related to online and hybrid teaching. The most popular events have been the ones looking at accessibility and reducing barriers for students engaging with class content.

Conferences

Our University hosts two conferences annual related to online and hybrid learning. The first conference in the academic calendar is in October and focuses on Technology in Teaching. This event is hosted by the team that owns the learning management system (LMS) and is attended by UVA faculty and staff. The event typically includes a keynote speaker, sessions, and a poster session. This event typically has 80-150 attendees.

The second event is at the end of the academic year and is called the Innovation in Pedagogy Summit. This event is in its sixth year and is open to everyone. This all-day event has a keynote speaker, parallel sessions, and break out workshops. This event typically has 300+ attendees.

Book Club

This year an affiliate organization in Virginia, IDEAx, hosted a book club. IDEAx has mostly instructional designers that participated in the book club which had four virtual sessions where participants discussed the selected boo, Flower Darby's *Small Teaching Online: Applying Learning Science in Online Classes*. In the final session, the author attended and spoke with participants. This was a very popular and we are looking at hosting within our University or within other affiliate networks in area a book or two next year. It is assumed that a book club would have 5-15 participants.

Workshops

There are several workshops that are hosted by our CTE. There is a week intensive called the Course Design Institute (CDI) that is held in the summer. CDI has 50 faculty attendees that work together with staff from the CTE to redesign their syllabus. CDI is an award-winning, nationally recognized workshop that builds a strong cohort community while focusing on how to create deep, meaningful learning for students.

UVA Acts is a faculty group that does roll play scenarios to have faculty work together to understand the student experience and improve their teaching. These workshops are typically day-long workshops with brown-bag lunches. The actors roll play scenarios and then the faculty work together to discuss how to integrate these ideas in their classrooms. These workshops typically have 25-50 attendees.

Certificate Programs

The University has institutional memberships to Quality Matters (QM), Online Learning Consortium (OLC), and the University Professional and Continuing Education Association (UPCEA). Each of these organizations offer professional development training. Certificate programs from QM and OLC are promoted to faculty and staff. Several people have participated in this programs and resources from these programs are archived in the LMS.

Additional Resources

There are additional professional development resources that are hosted within schools at our University. At our Curry School of Education (Curry) there are resources hosted in the school hosted LMS (Figure 8).   Within our School for Continuing and Professional Studies (SCPS) there are many resources including an Online Course Rubric (Figure 9), Expectations for Online Classes (Figure 10), and a YouTube channel called Hoos Learning (Figure 11).

Figure 8: Curry School of Education LMS screenshot of faculty resources.

Figure 9: School of Continuing and Professional Studies Online Course Design Rubric.

Figure 10: School of Continuing and Professional Studies Expectations for Online Courses.

Figure 11: School of Continuing and Professional Studies Hoos Learning YouTube Channel.

Conclusion

Supporting faculty whether through professional development or other resources leads to higher quality online teaching. Our institution has a range of professional development opportunities that includes self-serve toolkits, pop up support, webinars, conferences, book clubs, workshops, and certificate programs. The University is assessing opportunities to support faculty teaching hybrid and online classes and is always open to feedback for how to serve faculty and students. We are evaluating starting book clubs and pop up support desks around faculty meetings and events. There have been discussions of starting programs that may have financial stipends such as an annual award for Online Teaching or a fellows program for faculty teaching online. There is not one solution that works for all faculty but having a range of options has proven useful at our University.

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Massive Open Online Classes (MOOCs) are Not Dead: An Overview of Geographic and Degree Trends in MOOCs

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Abstract

In 2012, the New York Times proclaimed it was the year of the MOOC. By 2015, most academics in higher education in the United States and Europe were saying MOOCs are dead. During this presentation, I will present an overview of MOOCs from 2012 through 2019. I will walk through different product developments with a variety of MOOC platforms from free open educational resources (OER) courses to full online degree programs from elite universities. I will also walk through data illustrating which are the primary MOOC providers and geographic trends for what different regions are doing with MOOCs. This includes degrees in North America, partnerships across institutions for content in Latin America, credentialed courses that can be used for credit in any European institution and popularity of MOOCs in Asia. Participants will walk away from this session with a thorough understand of trends, products, and history of MOOCs globally from 2012 to the present.

Keywords: Massive Open Online Courses, MOOCs, Online Enrollment, Open Educational Resources, Online Degree Programs, Online Certificate Programs, Upskilling, Professional Development

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Introduction

Massive open online courses (MOOCs) were hailed in 2012 as a disruption (Christensen, Horn, & Johnson, 2008) to higher education that would lead to greater access to high quality educational content for the world. Proponents of MOOCs looked at MOOCs to address the escalating costs of education, the lack of required infrastructure in development nations, and the inequity of access to higher education. Then president of Stanford, John Hennessy, proclaimed that MOOCs were a tsunami about to disrupt education (Hennessy, 2012). MOOCs were seen as the disruption utilizing technology that would transform education (Lucas, 2013). In 2013, industry news proclaimed that MOOCs were dead (Borden, 2014). Faculty and university administrators that had not been early adopters creating accounts on MOOC platforms, quickly eschewed MOOCs and determined that based on low completion rates and the emerging research showing most MOOC takers were already college educated that MOOCs were a failure (Hansen and Reich, 2015). Yet, in 2019 there are dozens of MOOC platforms and an estimated 380 million learners across 30,000 courses with over 50 MOOC based degree programs. MOOCs are most definitely not dead.

This paper will look chronologically at the emergence of MOOCs, the development of different platforms based on region and domain, the results of monetization strategies, and geographic trends in MOOC adoption.

Discussion

Although MOOCs were in the media broadly starting in 2012, the original MOOCs began in 2008. Two MOOCs started around this time, Introduction to Openness in Education, with Stephen Downes and George Siemens and Digital Storytelling, DS106, with Jim Groom. These original MOOCs were open courses that focused on student participation in adding course content into the MOOC. This type of constructive input with students augmenting the course content ended up being termed connectivism (Downes, 2008). While there was some excitement in the open community about these courses, they did not enter the mainstream media to the extent of the 2012 providers. Other open content that preceded 2012 include content from Massachusetts Institute of Technology (MIT) Open CourseWare and Carnegie Mellon's Open Learning Initiative. Many other universities, such as Stanford, had been utilizing the iTunes platform to freely distribute to a global audience course content, typically recorded lectures from the back of a classroom.

In 2012, the main MOOC platform providers emerged, many of which were led by faculty at Stanford University's computer science department. Andrew Ng and Daphne Koller founded Coursera. Coursera partnered with universities to publish their university partner content. Sebastian Thrun partnered with Peter Norvig (Google) and created Udemy. Udemy partnered with faculty and focused on mostly science, technology, engineering and math (STEM) courses. Finally, Amin Saberi and Farnaz Ronaghi from Stanford founded NovoEd, a MOOC platform built around team-based projects. Outside of Stanford, edX was a major initiative with MIT and Harvard with tens of millions of dollars and staff investment. From the beginning, some of the platforms were funded by private companies while edX remained a public endeavor. Another start-up open content provider, Khan Academy, focused on K-12 math education.

Most of the discussion in 2012-2013 was about the broad reach of these new MOOCs and how the original MOOCs differed from the emerging new MOOCs on platforms like Coursera and edX. One of the popular figures from this time cited the enrollment of the Artificial Intelligence (AI) course taught by Sebastian Thrun and Peter Norvig. In this class, more than 160,000 learners signed up, it was said that this AI course may change the world (Leckart, 2012). Typical enrollment for similar classes on campus might have up to 100 students. In an instant, the MOOC was able to reach more students than could be taught by these instructors in 80 years assuming the class was offered once a semester for two semesters an academic year.

The original MOOCs were known as connectivist (Siemens, 2005) with those emerging later being referred to as behaviorist or xMOOCs. Connectivist MOOCs had learners that participated in the class create content for the class. Behaviorist or xMOOCs were said to be more edutainment where they consisted mostly of recorded lectures but had minimal student participation components: quizzes, peer-reviewed assignments, discussion boards, and on one platform team-based projects.

In 2013, we saw the emergence of additional platforms, more university partnerships, and more content. The most well-known emerging platform in 2013 was FutureLearn. FutureLearn is a European open content platform. Coursera grew in this time adding additional partners to their portfolio of content providers. Every institution that was in the MOOC space was working to understand what types of content would appeal to what types of learners. Most institutions started by mimicking the residential classroom and offering MOOCs up to 15 weeks in length. As data started coming in on completion rates, institutions quickly scaled down content duration and switched to a mode of offering shorter form content in 4-6 weeks with 1-5 hours of content per week. Institutions could also leverage best practices around how MOOCs could be utilized for career moves and how to reach learners that were most in need of the skills (Kolowich, 2014).

In 2013-2014, the big focus was on research to understand who was taking MOOCs (Christensen, Steinmetz, Alcorn, Bennett, Woods, & Emanuel, 2013) and the impact to those learners (Koller, 2012). With educational partners looking to understand MOOCs, research was a top priority. All those learners provided big data to understand what was actually happening within online courses. Researchers looked at understanding who was enrolling, engaging, disengaging and completing (Kizilcec, Piech, & Schneider, 2013). Buckets describing types of learners emerged: no-shows, observers, drop-ins, passive participants, and active participants (Hill, 2013). Data on patterns of engagement (Macleod, Haywood, Woodgate, & Alkhatnai, 2015) with the content were widespread along with understanding the delta between expectations and reality (Hollands and Tirthali, 2014). Many researchers referenced back to if MOOCs were serving the educationally underserved (Schmid, Manturuk, Simpkins, Goldwasser, & Whitfield, 2015). My own research in this area demonstrated that residential college students taking MOOCs as part of their for-credit classes did not watch all the videos, did not participate in online discussion forums on the platform, but highly valued the flexibility, ease of access, and ability to master the content through taking quizzes multiple times (Palmer, 2015).
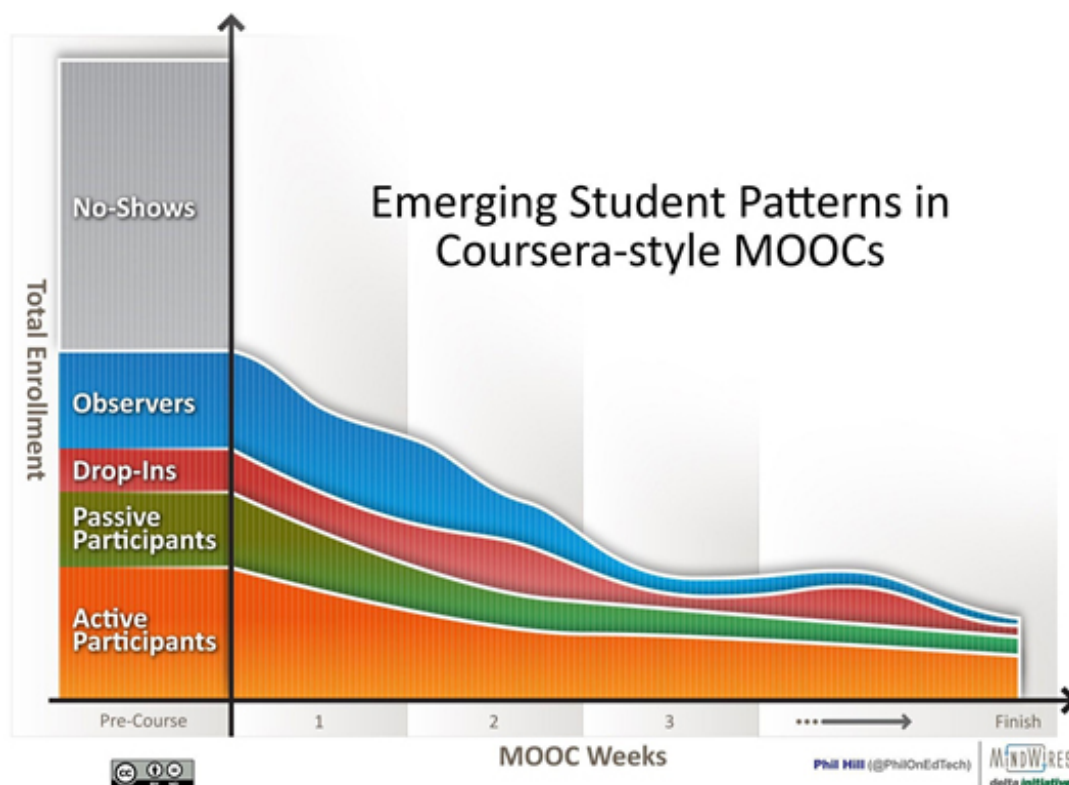
Figure 1: A chart of the Emerging Student Patterns in Coursera-style MOOCs (Hill, 2013).

The University of Pennsylvania, University of Washington, and Coursera did a joint research project to understand the learner outcomes on Coursera (Koller, Eriksson, & Zhenghao, 2015). This data grouped learners into two categories: education seekers and career builders. The published results stated that 87% of the career builders reported benefits: 3% received promotions, 3% received a raise, 62% were better equipped for current job, 43% improved candidacy for a new job, 26% found a new job, and 9% started a new business. Of the education seekers, 88% reported benefits: 64% gained knowledge essential to a field of study, 38% decided on a field of study, 38% refreshed concepts before going back to school, 18% received credits or waived prerequisites for an academic program, and 17% improved college admissions.

Figure 2: An infographic summarizing the Impact Revealed: Learner Outcomes on Coursera study (Koller, Eriksson, & Zhenghao, 2015).

In 2014, there was also much mapping of content providers and related partnerships. Researchers were mapping the emergence of MOOCs alongside online distance learning and open education, projecting the future of MOOCs into corporate training and tools to evaluate competency-based education.

Other researchers were arguing the model of open content for MOOCs and illustrating who founded the platforms. There was strong pressure for platforms that were financed with private equity, venture capital (VCs) firms, to have a sustainable

business strategy. For the private firms such as Coursera, the pressure was on to make money. This was fundamentally at odds with the concept of open content.

To address this growing pressure from funders, different platforms began introducing new products. In 2012, we had individual MOOCs. In 2013 we had series of related MOOCs that were clustered into a specialization. In 2014, monetization was introduced for MOOCs and specializations. In these monetized product offerings, a fee was charged for taking exams and getting certified statements of accomplishment for successful completion of the course work. For Coursera, they introduced monetization in their Signature Track product. Let's dive into the second quarter (Q2) through fourth quarter (Q4) revenues in 2014 of the Johns Hopkins Data Science Specialization hosted on Coursera shown in Figure 3. For Q2-Q4, the specialization had 12,486 average monthly learners enrolled in the Signature Track (=monetized) version of the specialization. Revenues from these learners during this time was $1.75 million dollars with 85% of learners in the Signature Track version of the course successfully completing all the course work compared to 10% of learners completing all the course work in the non-monetized version of the specialization (Shah, 2019).
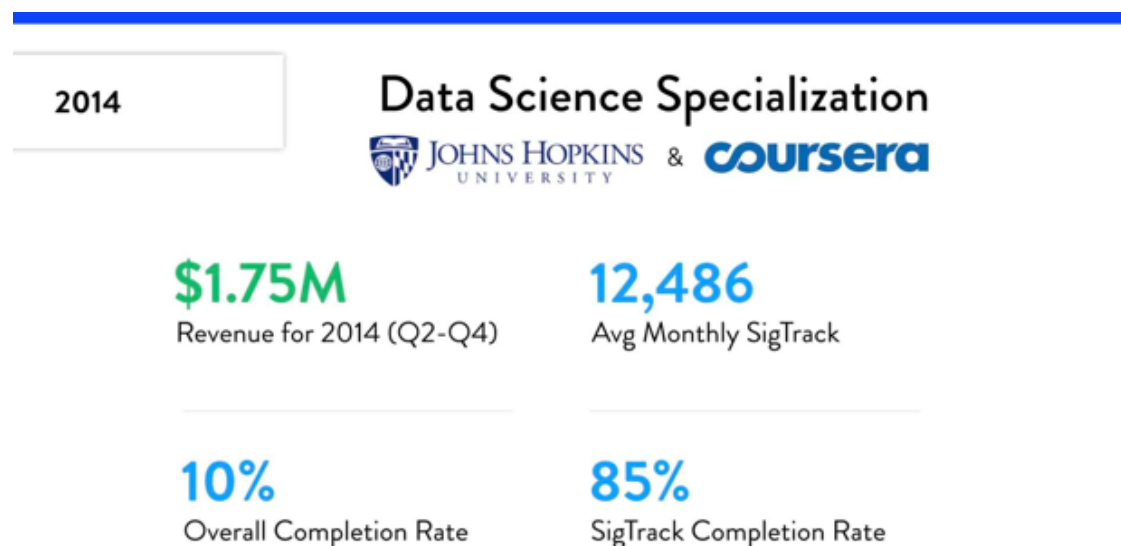
Figure 3: A slide image summarizing Q2-Q4 revenue from the Johns Hopkins Data Science Specialization hosted on Coursera (Shah, 2019).

This initial financial success of the Signature Track, monetized, course series lead to rapid productization on the platform. Soon after the release of Signature Track certificates, platforms started experimenting with selling to corporate training clients. Platform providers mapped out a series of products and price points: free, certificates (free and monetized), micro-credentials, for-credit, online degrees, and corporate training (Shah, 2018). Creating this portfolio strategy on the platforms provided a range of solutions for learners. Learners could take one course for free, if interested decided to buy a series of courses, and then apply to a university partner that would take the already completed MOOCs and provide credit at the institution.
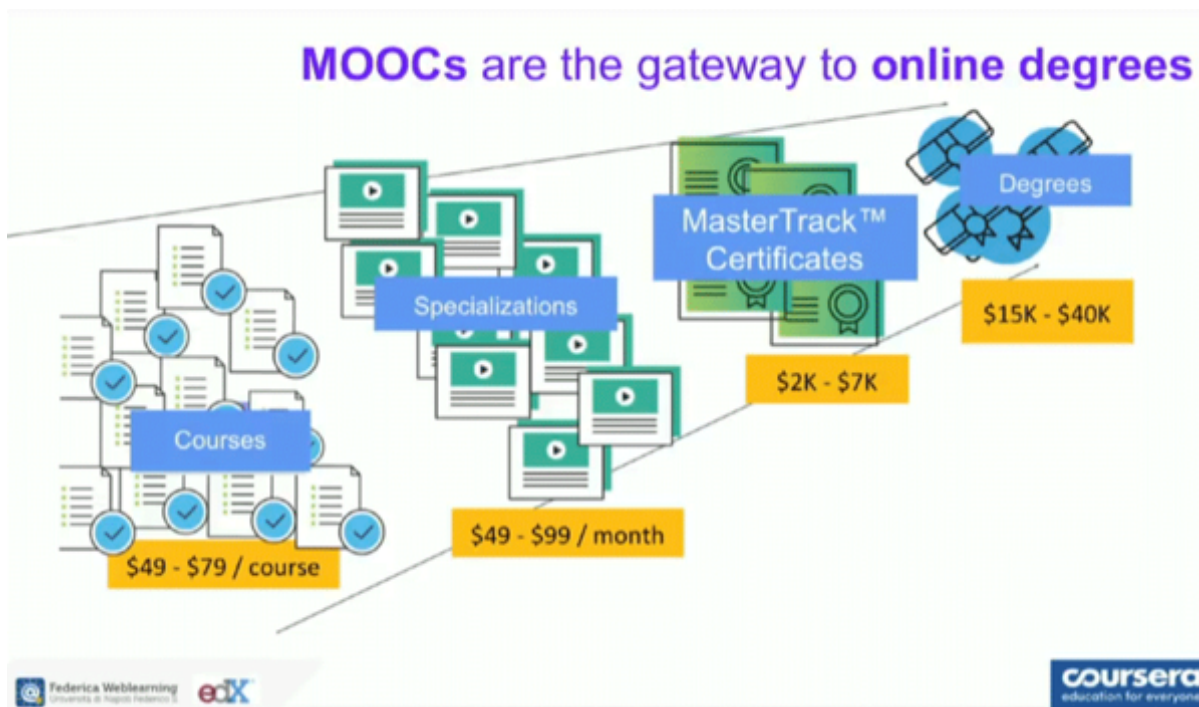
Figure 4: An infographic showing the different products and price points in Coursera.

This led to the first fully online degree programs (Figure 4). The earliest of these was the Online Master of Science in Computer Science (OMSCS) from Georgia Tech. This OMSCS degree quickly grew in scale, partially because of the platforms ability to reach a global audience and provide a robust technical infrastructure. The OMSCS was originally hosted on Udacity and created in partnership with a $3 million-dollar grant from AT&T. As of spring 2019 according to the Georgia Tech website, the OMSCS has had 26,000 applications, a total enrollment of 8,664, with students from 114 different countries (Figure 5).
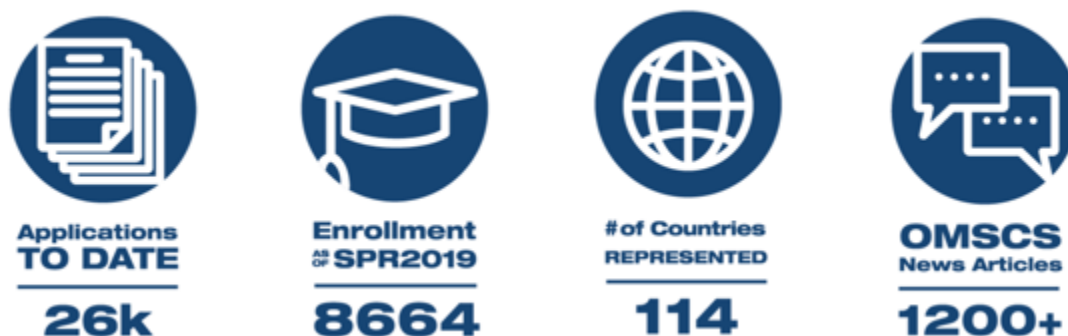
Figure 5: Enrollment data from the Georgia Tech Online Master of Science in Computer Science (OMSCS) degree program.

Figure 6 is a chart from Class Central mapping out the 'Product at Every Price' (Shah, 2019). In this figure, one can see the range from free courses to fully online degrees. These courses range from free to $30,000 for the degree. This chart also shows the cost for corporate training which became very popular in 2015-2016 as more corporate clients agreed to use Coursera as a central learning platform for their employee training.

Figure 6: Chart from Class Central mapping out "A Product at Every Price" (Shah, 2019).

In 2015, many other MOOC platforms were becoming established. Some platforms specialized in specific domains or subject areas. Examples of domain specific examples include Kadenze which focuses on math content. Udacity focuses on science and technology content. Other platforms were localized in specific regions. Examples of these platforms include FutureLearn in Europe and XuetangX became the main MOOC provider in China (Shah and Pickard, 2019).

In 2016, Coursera launched a new program, Coursera for Refugees. This effort demonstrated that Coursera was intent on providing open content to align with their mission, "We envision a world where anyone, anywhere can transform their life by accessing the world's best learning experience" (Coursera, 2012). This program has served over 11,000 refugees with 8,500 course completions (Figure 7).

Figure 7: Graphic on Social Impact Update: Coursera for Refugees.

In 2016, there was a regional MOOC explosion. Governments in India and China decided to utilize MOOCs to educate their citizens. This may be due to a lack of physical infrastructure in each of those countries. Without enough schools or teachers, the governments   Figure 8 illustrates all the MOOC providers that are now active providing content in Chinese. With government sponsorship and the technical infrastructure provided by the MOOC platforms, more localized content can be delivered to specific regions.

Figure 8: Graphic from Class Central on Chinese Language MOOC Platforms (Ma, 2019).

In 2016, according to Class Central there were over 58 million registered users and 6,850 courses (Shah, 2016). Figure 9 shows a list of the top five MOOC providers. MOOCs were definitely not dead with more learners on ore platforms taking more courses in countries around the world.

World's Top-5 MOOCs Providers

MOOCs provider	Country of origin	Year of launch	Number of registered users	Number of courses
Coursera	USA	2012	23 million	2329
edX	USA	2012	10 million	1319
XuetangX	China	2013	6 million	380
FutureLearn	UK	2012	5.3 million	485
Udacity	USA	2012	4 million	172

Source: Class Central, Dec 2016   Prepared by: nalanda2.org

Figure 9: Class Central chart of World's Top-5 MOOC Providers, 2016.

In 2017, Coursera added Coursera for Partners as a product offering. By this point, the Coursera platform options included: Coursera (direct sales to learners), Coursera for Enterprise (corporate training sales), Coursera for Refugees, Coursera for Government, and Coursera for Partners. Coursera for Partners had the first university partner, Duke, provided Duke students with access to all of the Duke created Coursera content for free. One of the biggest announcements with Coursera for Partners was when three top universities in Latin America started collaborating to provide free access to over 100 courses from these three universities.

In 2019, Coursera launched Coursera for Campus. This product was first announced in India. This product sells the Coursera for Campus platform to institutions that want to offer to their students courses that are hosted on Coursera. Institutions pay the same $400/student fee that corporate training customers pay to offer their students courses from elite brands hosted on Coursera (Shah, 2019).

Conclusion

MOOCs have reached millions of learners around the world. According to data reported by Class Central, there are over 380 million learners with dozens of MOOC providers, and over 13,500 courses, 820 micro-credentials, and 50 MOOC-based degrees (Shah, 2019). Despite low completion rates, research has found that the majority of learners that complete MOOCs have indicated positive impact on their careers or education. Governments that lack the necessary infrastructure and time to train teachers have leveraged regional MOOC platforms to scale education reaching millions of students. MOOC platforms continue evolving with new products and revenue streams announced each year. Content hosted on these platforms ranges in domain with an increased focus on stackable content that can lead to certifications or pathways into degree programs. MOOCs are most definitely not dead.

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The Associations Between the Perception of Helpfulness of Teacher Induction Programs and Anticipated First-Year Teacher Retention in China

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Abstract
The purpose of the study was to: (a) determine to what extent the formalized teacher induction programs (TIPs) are perceived to be helpful for first-year public primary school teachers in Shanghai, China; (b) measure anticipated job retention of first-year teachers; and (c) examine the degree to which these TIP helpfulness and anticipated job retention are associated. In this study, retention is defined as remaining in a Shanghai public primary school. Shanghai TIPs are one-year long, mandatory programs for first-year public primary teachers. The conceptual framework of TIPs includes four main components (orientation, mentoring, professional development, and teacher evaluations) as found in Horn, Sterling, and Subhan's (2002) high-quality teacher induction program component model. The study employed a non-experimental, correlational design and used survey responses from teachers to address the research questions. An on-line survey was completed by 408 participants who held a bachelor's degree or higher along with a teaching credential and who were within their first year of teaching in a Shanghai public primary school. Results of the study include: (1) Overall, Shanghai public primary school teachers perceived the level of TIP helpfulness to be relatively high; however, the levels of helpfulness varied across the four components; (2) The majority of participants expressed agreement with plans to stay in the same position; and (3) The perception of overall TIP helpfulness was a statistically significant predictor of anticipated teacher retention.

Keywords: Teacher induction programs, first-year teachers, teacher retention

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Introduction

In recent years, supporting and retaining new teachers has become a critical issue worldwide due to the rising teacher attrition rate (Ding, 2010; Foster, 2018). To support and further retain new teachers, Teacher Induction Programs (TIPs) were developed in western countries during the early 1960's and had become widely accepted by the 1980's. TIPs are "professional development programs and are designed to offer support, guidance, and orientation for beginning teachers during the transition into their first teaching job" (American Institutes for Research [AIR], 2015a, p. 5). It is "the period when teachers have their first teaching experience and adjust to the roles and the responsibilities" (Nielsen, Barry, & Addison, 2007, p. 15). TIPs can refer to a variety of activities involving new-qualified teachers, such as orientation, mentoring, professional development, collaboration with teacher networks, adjusting workload, and resource support (Clark, 2012; Harfitt, 2014; Huling, Resta, & Yeargain, 2012; Ingersoll & Smith, 2004; Ingersoll & Smith, 2012; Nielsen et al., 2007; Odell, 1992). Research indicates that TIPs are influential in raising the quality and efficiency of beginning teachers and having the potential to keep teachers in the profession (Alia, Muhammad, & Mishab, 2017; Allen, 2014; Dangler, 2016; Lemon & Garvis, 2017; Wong, Britton, & Ganser, 2005).

In Shanghai, growth in the percentage of teachers who are in their first year of teaching has gained attention because of employee retirement rising, migrants increasing, the One-child policy abolished, and new schools developing needs. The thirteenth Shanghai Education Revolution and Development Plan (2016-2020) clarified that developing Shanghai's TIP is one of ten crucial projects during the period of 2016-2020. To promote the plan, the Shanghai Municipal Government and Shanghai Education Municipal Commission are providing essential support in terms of organization, finance, policy, and resources (Shanghai Municipal People's Government Office, 2016).

In response to these demands placed upon first-year teachers and policy changes, the Shanghai TIP was reformed in 2012. This formalized TIP version reorganizes and consolidates resources from Shanghai Educational Municipal Commission, school districts, and schools, utilizes rich activities and a reasonable teacher evaluation system (Chen & An, 2016). However, first-year teachers' perspectives of this new program and the evaluation of this program are mentioned but not systematically investigated. Also, few studies have addressed the potential variation in perceptions of helpfulness of the formalized TIP version for first-year teachers with different educational backgrounds.

The purpose of the study is to: (a) determine to what extent the formalized teacher induction programs in Shanghai are helpful for first-year teachers; (b) measure teacher anticipated job retention of first-year teachers in Shanghai public primary school; and (c) examine the degree to which these perceptions of helpfulness and anticipated job retention are associated. A study of the effectiveness how helpful are teachers in primary schools in Shanghai feeling the TIPs is necessary. Knowledge gained from this study may aid the government in reaching its goal while keeping funding to a reasonable level. The study may suggest how TIPs can be modified to better support first-year teachers and it may reveal gaps in the knowledge base that future research should address.

Research questions are listed as follows: (1) To what extent do teachers perceive TIPs to be helpful? (2) To what extent do teachers' plans indicate an intent to remain in the public school teaching profession? (3) Is there an association between the helpfulness of teacher induction programs and anticipated teacher retention after controlling for gender, educational level, and major?

Conceptual Framework

The components of TIPs vary across schools and districts. Horn, Sterling, and Subhan (2002) identified that high-quality TIPs encompass four components: orientation, mentoring, professional development, and teacher evaluation. Their model is used as the conceptual framework of TIPs for the current study where first-year teachers' perceptions of the helpfulness of TIPs will be examined. In addition, associations between these perceptions of TIPs helpfulness and anticipated teacher retention will be explored. Each component is listed and explained below.

Orientation. Horn et al. (2002) defined orientation as "intended to orient new teachers to the community, district, curriculum, and school" (p. 8). Orientations vary significantly from a half-day to seven full working days, depending on the district schedule. The topics of orientations include: welcoming new teachers, introducing the academic goals/learning and learning philosophy of the districts, reviewing the policies, and addressing induction issues.

Mentoring. Mentoring is defined as "one in which the administration has a mentoring program in place with specific guidelines, programs are funded, mentors are compensated in some way, and there are specific expectations and policies regarding the mentoring process" (Horn et al., 2002). Mentoring is regarded as a key element to help the first-year teachers' transition from a university student learning to teach to a full-time teacher in the classroom. Mentors are generally appointed by school administrators or universities and participate in supervision.

Professional development. Horn et al. (2002) define professional development as providing opportunities for the first-year teachers to achieve additional knowledge, skills, and attitudes necessary for successful teaching. It is necessary for beginning teachers to continue the professional role in a life-long teaching career. Professional development activities may address a variety of topics, such as instructional strategies, back-to-school night, parent-teacher conferences, research methodologies, and technology supports. Professional development can be provided through workshops, seminars, conferences, observations, and collaborations.

Teacher evaluation. Analyzing new teachers' teaching practices periodically is beneficial for mentors, administrators, and teachers. Through this analysis, they come to know their strengths and weaknesses (Horn et al., 2002). Also, teacher evaluation determines whether the first-year teachers are qualified to retain.

The effects of TIPs

Ingersoll (2011) demonstrated that providing a package of teacher support (such as TIPs) is more powerful than only one component (such as mentoring programs). Researchers have discussed the relationships between the TIPs and teacher retention,

professional development, and student outcomes. Many researchers proved that TIP participants developed skills and capabilities in positions and had higher retention rates than non-participants. Huling and colleagues (2012) compared the retention rates of 954 beginning teachers in Texas and concluded that "Participants in the induction program have higher retention rates than other teachers from across the state and within their same regions of the states" (Huling et al., 2012, p.142). Allen (2014) examined the effect of supporting novices during the university-based induction years on teacher development and teacher retention through both quantitative and qualitative methodologies. The results of the study showed that induction programs positively affect maintaining professional networks, teacher efficacy, curriculum writing, and high teacher retention (Allen, 2014). Nielsen and his colleagues (2007) researched 826 new teachers across three years and discovered that the TIP has a positive impact on teacher development, and that individual resources training and collaboration with teacher networks were the two most beneficial elements for novice teachers' growth.

However, this positive relationship is also being challenged. Williams and Gillhan (2016) generalized that the first-year teachers not only have positive perceptions of induction programs such as having favorably assessed mentors, interdisciplinary teams, and administrative support in the programs, but also have mixed and negative experiences. Mixed experience means that program participants favored induction program activities but did not receive enough support from administrators. Negative experience illustrates that participants received insufficient support and overwhelming workloads. Moreover, Gaikhorst and colleagues (2015) argued that there is no association between induction programs and job motivation or teacher retention although the programs have a positive impact on teacher competence and self-efficacy (Gaikhorst, Beishuizen, Zijlstra, & Volman, 2015).

Gaps in the Literature

Although the relationships between the effectiveness of induction programs, teachers' growth and their anticipated retention have been discussed, some deep questions are raised, such as: how are these components correlated? Also, there is no empirical study that examines the helpfulness of these components associated with first-year teacher retention.

Research Design

The study employed a non-experimental, correlational design and used survey responses from teachers to address the research questions. The target population was first-year teachers in Shanghai public primary schools. The selection criteria was that participants had a bachelor's degree or higher along with a teaching credential and that they were within their first year of teaching in a public primary school located in Shanghai. Due to practical constraints, convenience sample was employed.

To determine how many teachers to invite to participate in the study, the software G*Power 3.1.9.3 was utilized by specifying the alpha level to be .05, the desired power to be .80. Assuming a 70% response rate, at least 564 teachers needed to be recruited for the study. If the effect was larger or the response rate was higher, the statistical analyses would achieve a power even higher than .80.

Instrumentation

The data for this non-experimental study was collected through a web-based survey. The contents of the survey included three sections: (a) demographic information (i.e., gender, education level, and majors); (b) the perceptions of helpfulness of TIP scale (on orientation, mentoring, professional development, and teacher evaluations); and (c) anticipated first-year teacher retention.

The scale of helpfulness of formalized teacher induction programs is based on the conceptual framework of high-quality induction programs offered by Horn, Sterling, and Subhan (2002). The scale aimed to assess how helpful the first-year teachers perceive the TIP was overall, as well as each of the components. The scale used a 5-point response option for each item, with anchors at 0-not at all, 1-of little help, 2-somewhat helpful, 3- helpful, and 4-very helpful. Higher scores corresponded to perceptions of the TIP being more helpful. Definitions of four TIP components were included in the survey as adjustments.

The teacher retention scale was developed to assess the extent to which teachers have considered various career options: (1) staying in the same teaching position, (2) relocating to a different public primary school, (3) relocating to a private school, (4) relocating to a private institution other than private schools, and (5) changing to a different profession. The scale used a 5-point response option for each item, with anchors at 1-strongly disagree, 2-disagree, 3-undecided, 4-agree, and 5-strongly agree. After reversing scoring items 3, 4, and 5, the higher the score was, the more likely the first-year teacher plans to remain a public Shanghai primary school teacher.

All the items were translated from English to Mandarin by one person, and back-translated to English by a separate individual. Prior to its use in this study, the survey was piloted with a handful of teachers who participated in a TIP in Shanghai in recent years. Reliability and validity were investigated using the study data itself and are reported in the results section.

This study applied three control variables: gender, college major, and degree level. Research studies demonstrated the influences of gender, major, and degree level on anticipated retention (Klassen et al., 2009; Klassen & Chiu, 2010; Struyven &Vanthournout, 2014; Wu, 2018).

Data Analysis and Presentation

Descriptive analyses provided information as to teachers' perceptions of TIP helpfulness and their plans regarding remaining in the teaching profession. The study also used correlational analysis methods to identify whether perceptions of helpfulness of TIPs were associated with first-year teachers' anticipated retention in Shanghai public primary schools. The direct effects of the perception of TIP helpfulness on anticipated teacher retention were evaluated. SPSS 25.0 was used to analyze the collected data using an alpha level of .05 for identifying statistically significant results.

Limitations

Based on threats to internal, external, construct, and statistical conclusion validity, as summarized in McMillan and Schumacher (2010), the following limitations of this study are acknowledged. First, since data were self-reported by participants, subject effects may operate whereby the answers they provided may not reflect how they really felt or behaved. Second, the study used a convenience sample rather than a teacher database consisting of all Shanghai first-year teachers; therefore, the population external validity was limited to those teachers with characteristics like those who responded. Third, the study investigated the anticipated first-year teacher retention rather than actual teacher retention. Therefore, some respondents may choose to remain despite their stated intentions. Last, although care was taken to generally phrase the research questions in terms of association rather than effects, a limitation of the study is that correlational design limit our ability to draw causal inferences. The results may be suggestive, but further research is needed in order to draw conclusions about TIP impacts.

Results

The demographic information regarding the respondents were provided. Nearly 70% of the participants' ages were in the range of 23-25. The percentages of females and males were nearly 85% to 15%, respectively. The percent of participants who held Bachelor's and Master's degree was 91.4% and 8.6%. No one held a Doctoral degree. About 20% of participants were in education major, 40% were in core course majors (Chinese literature arts, applied mathematics, or English), and 40% were in elective course majors (sciences, music/arts, or others). Nearly half of participants taught core courses and the other half taught elective courses. Also, about 60% of participants reported that their average actual teaching workload with students present was 21-25 class periods per week (where one class period lasts 35 minutes).

Research Question 1 (RQ1) examines the extent to which teachers perceive TIPs to be helpful. Table 1 below shows the descriptive statistics for the measure of TIP helpfulness overall and its subscales. Overall, across the four aspects of TIP helpfulness, the mean of 3.34 indicates that teachers, on average, viewed the TIP as "helpful." Teachers perceived the TIPs to be the most helpful in terms of mentoring (mean = 3.49) and the least in terms of teacher evaluation (mean = 3.22). Still, based on the means for all 4 subscales, the teachers report the TIPs to be helpful.

Table 1: Descriptive statistics for the overall scores and subscales of the measures of TIP helpfulness

	M	SD	Min	Max
TIP Helpfulness (Overall)	3.34	0.750	0	4
Orientation	3.25	0.953	0	4
Mentoring	3.49	0.784	0	4
Professional Development	3.41	0.794	0	4
Teacher evaluation	3.22	0.961	0	4

Table 2 shows the frequency and perception of helpfulness for each TIP component. The majority of teachers thought that mentoring (60.3%) and professional development (53.2%) was "Very Helpful." Forty percent of teachers perceived that

professional development and teacher evaluation were "Helpful." Less than 8% of first-year teachers reported that the TIPs were of no or little help in terms of any of the four components.

Table 2: The Frequency and Perception of Helpfulness in TIP components

	Not at all	Of Little Help	Somewhat Helpful	Helpful	Very Helpful
Orientation	10	20	27	153	198
Percentage (%)	2.5%	4.9%	6.6%	37.5%	48.5%
Mentoring	7	8	8	139	246
Percentage (%)	1.7%	2.0%	2.0%	34.1%	60.3%
Professional Development	7	8	13	163	217
Percentage (%)	1.7%	2.0%	3.2%	40.0%	53.2%
Teacher Evaluation	12	18	27	163	188
Percentage (%)	2.9%	4.4%	6.6%	40.1%	46.1%

Research Question 2 (RQ2) examines the extent to which teachers' plans indicate an intent to remain in the public school teaching profession. The higher ratings of agreement on Item 1 and Item 2, the more possibility first-year teachers intend to remain teaching in Shanghai public primary schools. The higher ratings on Item 3, 4, and 5, the more possibility first-year teachers are willing to leave teaching in Shanghai public primary schools. After reverse-scoring items 3, 4 and 5, Cronbach's alpha was calculated as an estimate of the scale's internal consistency reliability. Item #2 was problematic as it lowered the reliability to just .530; with its removal, the 4-item scale reached an acceptable level of reliability (a = .781). Thus, the remaining analyses are based on the 4-item scale (without item #2). Averaging across the four items, the mean of anticipated teacher retention is 4.16, which suggests that, overall, the first-year teachers, on average, agreed with statements reflecting an intention to stay (and, relatedly, disagreed with statements reflecting an intention to leave) teaching in a Shanghai public primary school. See Table 3 for the descriptive statistics of the overall measure and each of the individual items prior to reverse-scoring items 3, 4, and 5.

Table 3: Descriptive statistics for the overall score and individual items measuring
anticipated teacher retention (before reverse scoring Items 3, 4, and 5)

	Cron-bach's alpha	*M*	*SD*	*Min*	*Max*
Anticipated Teacher Retention (5-item Mean)	.530	3.88	.428	1.80	4.80
Anticipated Teacher Retention (4-item Mean without Item #2)	.781	4.16	.557	1.00	5.00
1. Stay in Same Position	-	4.24	.617	1	5
2. Relocate to Different Public Primary School in Shanghai	-	2.79	.764	1	5
3. Relocate to Private Primary School in Shanghai	-	2.08	.616	1	5
4. Relocate to Private Education Institution other than Private Schools	-	1.81	.721	1	5
5. Change to Different Profession other than Teaching	-	1.73	.882	1	5

Table 4 provides the frequencies and percentages of responses to the anticipated
teacher retention items (before reverse-scoring Items 3, 4, and 5). The majority of
first-year teachers "Agree" (63.5%) or "Strongly Agree" (31.4%) with staying in the
same position. Few participants (less than 5%) responded they intended to relocate to
private schools, private educational institutions other than private schools, or change
to a different profession other than teaching.

Table 4: The Frequency and Percentages of Anticipated Teacher Retention Items
(Before Reverse Scoring for Item 3, 4, and 5)

		Strong Disagree	Disagree	Un-decided	Agree	Strongly Agree
1. Stay in Same Position	*n*	3	2	16	259	128
	%	.7%	.5%	3.9%	63.5%	31.4%
2. Relocate to Different Public Primary School in Shanghai	*n*	24	93	240	46	5
	%	5.9%	22.8%	58.8%	11.3%	1.2%
3. Relocate to Private Primary School in Shanghai	*n*	49	290	61	5	3
	%	12.0%	71.1%	15.0%	1.2%	.7%
4. Relocate to Private Educ'n Instit'n other than Private Schools	*n*	140	217	44	4	3
	%	34.3%	53.2%	10.8%	1.0%	.7%
5. Change to Different Profession other than Teaching	*n*	199	145	46	12	6
	%	48.8%	35.5%	11.3%	2.9%	1.5%

Research Question 3 (RQ3) examines the association between TIP helpfulness and anticipated teacher retention after controlling for gender, level of education, and major. It was designed to test the influence of the helpfulness of TIP on anticipated teacher retention after controlling for gender, level of education, and major.

The overall anticipated teacher retention in Shanghai public primary schools scores were regressed on the total rating they gave regarding the helpfulness of the TIP across four components in which they participated. The full model was statistically significant, $F(4, 403)= 13.986$, $p < .001$, with gender, major, and TIP helpfulness ratings all accounting for statistically significant proportions of unique variation in anticipated retention (see Table 5). Females agreed to a greater extent, than males, with items measuring anticipated retention, as did those who were not education majors, as compared to those who did major in education. When TIP helpfulness rating increased by a value of one point, the anticipated teacher retention would increase by .210 point ($b= .210$, $p< .001$). Thus, for this research question, the predicting anticipated teacher retention from perceptions of the helpfulness of teacher induction programs being statistically significant was met.

Table 5: Summary of simultaneous multiple linear regression results predicting anticipated teacher retention from perceptions of the helpfulness of teacher induction programs

	b	SE_b	β	t	p
Control Variables:					
Gender (0=Male)					
Female (1=Female)	.167	.073	.108	2.293	.022*
Level of Education (0=Bachelor's)					
Graduate Degree (1=Graduate)	-.074	.093	-.037	-.797	.426
Major (0=Education)					
Not Education Major (1=NotEd)	.159	.064	.117	2.459	.014*
Predictor Variable:					
Helpfulness of TIPs	.210	.035	.284	5.982	<.001**

*$p < .05$ **$p < .01$*
Note: R= .349, R^2= .122 , F(4, 403)= 13.986, p< .001

Discussion

As the results of RQ1 shows in the study, first-year teachers in Shanghai public primary schools had a very high TIP participation rate. Almost all of the participants (except for one) reported that they attended a Shanghai TIP in their first year of teaching. The result is the same as the literature, that the "Shanghai TIP participation rate is 97%, which is higher than those in the other areas and countries" (Zhang, Ding, &Xu, 2016). Also, this result indicates that participating in a TIP is required for the first-year teachers in Shanghai public primary schools and it is a partial requirement to renew their teaching credentials (Order No.55, Shanghai Education Commission, 2013). Secondly, the majority of the participants (except for two individuals who attended only some of the TIP activities) attended all four types of TIP activities that the survey items inquired about (orientation, mentoring, professional development,

and teacher evaluation). The results suggest that the Shanghai TIP programs' organization is consistent with Horn, Sterling, and Subhan's (2002) TIP model. Thirdly, regarding Shanghai first-year teachers' perceptions of TIP helpfulness, the results of this study are that TIP helpfulness is rated relatively high. The mean of TIP helpfulness overall was 3.34 (out of 4), which falls within the range closest to the descriptor "helpful". Also, the mean ratings for sub-items (orientation, mentoring, training, and evaluation) were all in the "helpful" range (above "not very helpful" but not reaching "very helpful"). The highest helpfulness rating was for mentoring (M= 3.49) and the next highest was for professional development (M= 3.41) which was consistent with the previous related studies that found mentoring and professional development to be regarded as the two most helpful components in TIPs (Clark & Byrnes, 2012; Ding, 2010).

To improve the perception of helpfulness of Shanghai TIPs, participants responded to open-ended questions and expected Shanghai TIPs should be more "practical," "interactive," and "efficient". "Being practical" means the Shanghai TIP should include case studies where they can prepare skills for their jobs, including describing a situation/a student, identifying an issue, analyzing a situation and finding a resolution. "Being interactive" indicates that first-year teachers look for TIPs offering them more time to communicate with peers and teacher experts. Also, "being efficient" means first-year teachers hope for less paperwork in TIPs but more opportunities to expose their horizons in observations and research studies.

Research Question 2 (RQ2) investigates, "To what extent do teachers' plans indicate an intent to remain in the public school teaching profession?" After reversing the scores of Item 3 "thinking of relocating to a private school", Item 4 "thinking of relocating to private educational institutions other than private school", and Item 5 "thinking of changing to a different profession other than teaching", the results showed that the average for teacher anticipated teacher retention (5-item) is 3.88 out of 5. After deleted item 2,"thinking of relocating to a different public primary school", the average for teacher anticipated teacher retention (4-item) is 4.16 out of 5. It means that first-year teachers at Shanghai public primary schools have moderately high-anticipated teacher retention. The majority of participants chose "Agree" (63%) and "Strongly agree" (32%) on "thinking of staying in the same teaching position." When asked about "relocating to a private primary school", "relocating to a private educational institution other than private schools", or "relocating to a different profession other than teaching", 4% of the participants selected "agree" or "strong agree." The results reveal that a majority of first-year teachers in Shanghai public primary schools intend to stay in public schools. The results of this study show a higher anticipated teacher retention rate than what is found in a prior study about Shanghai public primary teachers. Wu (2018) studied teachers in Shanghai public primary schools and concluded that about one-third of teachers considered leaving. Based on the author's perspective and experience during the study, one possible reason for this discrepancy could be due to the fact that Wu (2018) studied teachers in Shanghai public primary schools, including those beyond their first-year of teaching.

Research Question 3 (RQ3) asked, "Is there an association between the helpfulness of TIP and anticipated teacher retention after controlling for gender, educational level, and major?" The study explored whether the perception of TIP helpfulness is significantly and positively correlated to anticipated teacher retention. The multiple

regression analyses also indicated that perception of TIP helpfulness was a statistically significant predictor of anticipated teacher retention. The results are consistent with findings in the literature that participating in TIPs positively impacts teacher retention (Allen, 2014; Huling et al., 2012; Nielsen, 2007).

There are several possible reasons why female teachers have relatively high-anticipated teacher retention as compared with male teachers. The results are the same as Ding's (2010) and Zhu's (2014) studies in Mainland China. Also, from the author's perspective, there are several reasons. At first, there are more female graduates majoring in education than males in colleges. Zhu (2014) reported that the percentage of female college students in education in Mainland China is 65.3% while just 34.7% are male students. The remarkable difference in gender in college graduates not only means that there are more females than males who choose to study education but also reveals that the expectations for females more so than males, to some extent, may be to have a stable occupation such as teaching and accounting after college graduation. In addition, males are expected to earn more than females. However, teaching in public primary schools may not pay as much as other positions. Thus, due to some or all of these reasons, it seems reasonable that the retention rate of male teachers in public primary schools is lower than it is for female teachers.

Also, teachers who are not education majors have higher anticipated teacher retention than those who are education majors. These results are consistent with previous literature that suggested gender and college major affect teacher retention (Ding, 2010; Struyven &Vanthournout, 2014). Beyond those past findings, this author considered that the result might be related to the National Higher College Entrance Exam (NCEE), namely "Gaokao," in Mainland China. NCEE is an annual academic qualification test required of almost all high school graduates who hope to pursue an undergraduate education. Zhang (2017) described the importance of the NCEE as "the pivotal moment for Chinese secondary students as their scores in large part determine their future – whether they can go to university, which institution they will be admitted and consequently what careers await them" (para. 10). In other words, what major the candidate will learn in college is dependent on his or her NCEE score rather than his or her application. A candidate who is willing to learn education but who has not attained the minimum score required of education majors cannot be accepted as an education major in college. Therefore, it is reasonable that non-education major teachers may feel highly appreciative for the opportunity to enter and remain in teaching.

Conclusion

With the increasing growth of student population and its increasing educational standards in Shanghai, teacher education becomes a hot topic. First-year teaches are new entries into profession. They could become a strong teaching force in the near future if they are provided efficient and sufficient support. In turn, student achievement may be positively impacted. Thus, it is necessary for educators to study the effectiveness of TIPs as perceived by Shanghai primary school teachers in terms of how helpful they find the TIPs. The study results provided strong evidence that there is positive relationship between helpfulness of Shanghai TIPs and anticipated teacher retention.

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Pictogramming Workshop
- Learning Programming Concepts with Pictogram Contents Creation -

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Abstract

We have been developing content creation environment using human pictogram, called "Pictogramming." This application can be accessed freely. Pictogramming is coined from two words, "pictogram" and "programming". Pictograms are widely used in various fields such as counseling, safety, and facilities. Thus, the pictogram has been researched in various fields. Pictogramming also has aspects of a programming learning environment. Pictogramming is designed with the goal of creating pictograms, so its command set and functions are limited compared to general programming languages. It leads to fit for educational use and it also has the advantage that an understanding of the concepts of programming such as sequential execution, parallel execution, variables, looping, conditional statements, etc. can be achieved through pictogram creation without much learning cost. Our past research proved that posturing human shaped pictogram by this application generates humor and surreal emotions, which also promotes communications between learners. This time, we would like to introduce this application and show off some practice examples and after that we held short workshop that each participant makes pictogram signs.

Keywords: Pictogramming, Pictogram, Programming education, Design education, Python, Block

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Introduction

We have been developing a programming learning environment for novices called "Pictogramming [Ito 2018a]," which has been released on the web (http://pictogramming.org/) . This name originates from a combination of words: "pictogram," and "programming." Pictogramming is designed to learn programming concepts through the creation of pictograms. This paper describes the outline of this application and shows syllabus examples of classes or workshops using Pictogramming.

Pictogramming

Pictogramming is a web application. Figure 1 shows a screenshot of the application when it is accessed using a PC browser. The application comprises three areas: the human pictogram display panel on the left side of the screen, the program code description area on the right, and several buttons to help code input on the bottom.
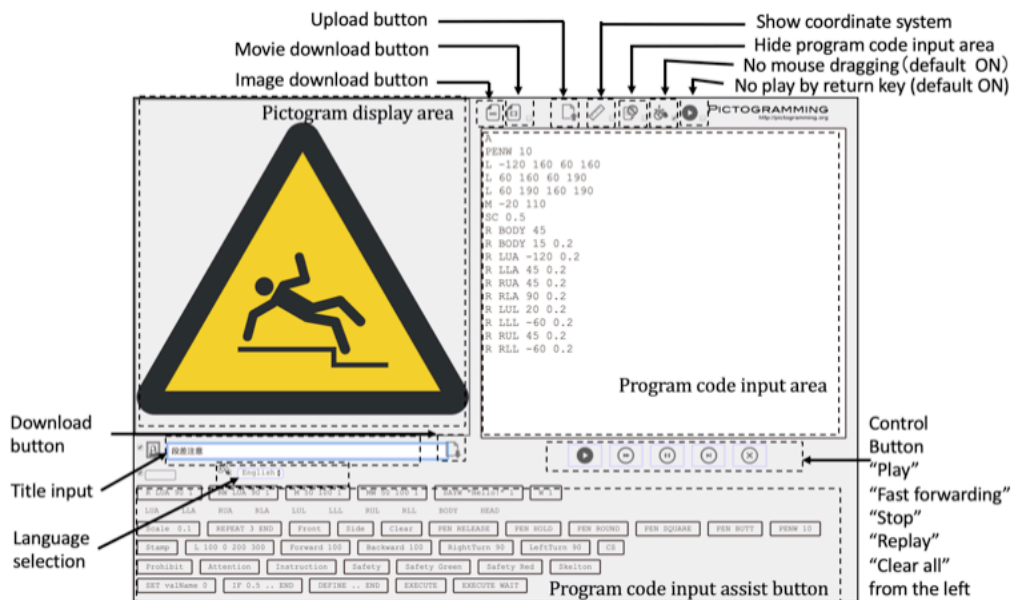
Figure 1: Screen shot of Pictogramming

A large human-shaped pictogram is displayed in the human pictogram display panel. The panel can display the human pictogram in either the front direction or the side direction, as defined by the ISO 3864's appendix section. The human pictogram consists of nine parts: body and head (considered a single part), two upper arms, two lower arms, two upper legs, and two lower legs. The size of each part conforms to ISO 3864.

Learning Programming Concept and Pictogram Design Principle with Pictogramming

The lessons and workshops using Pictogramming are designed to be able to transit following three phases smoothly in a limited time.

Phase 1: Posing and Human Motion

Operations on the human pictogram constitute the inputs and are defined in the "Program code description area. " Pictogram focuses on pictogram creation and uses a simple and limited instruction set. The input string to change states (positions) follows a format that separates opcode and arguments with blanks, as follows.
opcode arg1 arg2 …

Figure 2 shows an example of program.
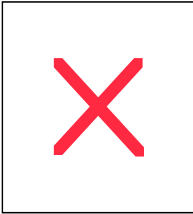

```
R LUA -120 1
RW RUL 10 1
IF 0.3
  REPEAT 2
    RW LLA -60 0.3
    RW LLA 60 0.3
  END
  M 100 0 1
END
```

Figure 2: Sample Program

In figure 2, "R LUA -120 1" as illustrated in line 1. R is an operation to rotate a part of the body specified with the first argument. The human pictogram has a total of nine parts, body and head (considered as a single part), two upper arms, two lower arms, two upper legs, and two lower legs. That first argument LUA means the Left Upper Arm. The second argument gives the degrees counterclockwise of the angle of rotation, and the third argument represents the seconds required to rotate. If the third argument is omitted, then, it would be treated as 0. Hence, line 1 means "Rotate the Left Upper Arm 120° clockwise for 1 s and next command executes simultaneously. The character "W" in "RW RUL -10 1" shown line 2 means that next command executes when this rotation has finished. Line 2 indicates "Rotate the Right Upper Leg 10° counterclockwise for 1 s and the next command is not executed until the movement is complete. Line 3 "IF 0.3" means execute following commands until corresponding "END" at a probability of 30%, and Line 4 "REPEAT 2" means execute following commands 2 times. Hence, lines 3–8 represent waving the Left Lower Arm (LLA) two times at a probability of 30%. R and M are most used command to formulate posture and human motions. Table 1 shows a specification of these commands.

Table 1: The specification of R and M command

Command Format	Process
R arg1 arg2 [arg3]	Rotate arg1, a part of the body, arg2 degrees counterclockwise over arg3 seconds. If arg4 is omitted, then arg4 is treated as 0. If arg3 are omitted, the arg3 is treated as 0. The next command executes simultaneously. If R changes to RW then the next order is not executed until the rotation is complete.
M arg1 arg2 [arg3]	Move arg1 pixels in an X-axis positive direction and arg2 pixels in a Y-axis positive direction with linear uniform motion over arg3 seconds. If arg3 is omitted, then arg3 is treated as 0. The next command executes simultaneously. If M changes to MW then the next order is not executed until the rotation is complete.

It is also possible to describe basic programming concepts such as looping, conditional branching, and procedures.

Phase 2: Drawing objects by human motion

Line drawings such as Turtle graphics is often used in programming learning. Pictogramming has PEN command to provide line drawing method drawn with the movement history of the human pictogram. The specification of PEN command is shown in Table 2. This method enables to transit from Phase 1 naturally and easily [Ito 2019b].

Table 2: The specification of PEN command

Command Format	Process
`PEN arg1 arg2`	Release Pen if arg1 is "RELEASE" or "UP", hold pen if arg1 is "HOLD" or "DOWN." A part of body can be set as arg2 to set the location of releasing or holding the pen only if arg1 is "RELEASE", "UP", "HOLD" or "DOWN." IF arg2 is omitted, it is considered to set "BODY". Initial state of pen is released for all parts of body.

The command "R arg1 arg2" and "RW arg1 arg2", "M arg1 arg2" and "MW arg1 arg2" behaves the same way when viewed in terms of human motion. However, these behave the different way when drawing something by one of the body parts according to the rules mentioned below.

(Rule 1) Define a command set that consists of continuous R and M commands with time 0, or continuous R and M commands with time 0 and RW and MW commands with time 0 after that. The command set draws a line whose edges are the original position and the position the command set establishes.

(Rule 2) RW and MW commands with time 0 draws a line segment connecting the original position and the position this command establishes.

Various figures can be described with just a few commands by making good use of human actions in Phase 1 and adopted only simple rules defined above. The drawing examples are shown in Fig. 3.

Figure 3 (a) shows a program for drawing a square. Line 1 "SK" is made transparent to be able to display figure hidden by the pictogram. Line 2 "PEN HOLD LLA" specifies a part of the body and drawn as the movement history of left hand. Line 4 "RW LUA 90" has no time argument, which is equal to set 0. It means drawing a line with Rule 2, that is, drawing one side of the square. Drawing the circle is simple. Figure 3 (b) is the program, that is, hold a pen on the left hand and rotate an arm 360 degrees within a time interval greater than 0.

It is possible to draw various figures by combining more than one "R" and "M" commands. Figure 3 (c) draws a swirl and Figure 3 (d) draws a Lissajous curve by moving two joints (shoulder and elbow) simultaneously, and Figure 3 (e) draws a sine curve by moving two joints and the body itself simultaneously. Figure 3 (f) draws a diamond. It is also possible to draw by combining non-"W" commands (which means "R" and "M" commands) and "W" commands (which means "RW" and "MW" commands). Line 4 to 5 and line 7 to 8 in Figure 3 (g) draw a sector's side by bending both a shoulder and an elbow simultaneously. Line 4 to 5 and line 6 to 7 in Figure 3 (h) draw a diamond's side according to Rule 1. This is called "Human motion drawing" in our framework. "Human motion drawing" evokes emotional empathy as

in the case of turtle drawing. Participants promote self-identification to human pictograms created by other participants.

```
SK
PEN HOLD LLA
REPEAT 4
RW LUA 90
END
```

(a)

```
SK
PEN HOLD LLA
R LUA 360 3
```

(b)

```
SK
PEN HOLD LLA
R LUA 1440 4
RW LLA 180 4
```

(c)

```
SK
PEN HOLD LLA
R LUA 360 3
R LLA -1440 3
```

(d)

```
SK
PEN HOLD LLA
R LUA 720 2
R LLA -1440 2
M 300 0 2
```

(e)

```
SK
REPEAT 2
PEN HOLD LLA
REPEAT 3
RW LUA 120
END
PEN RELEASE LLA
RW LUA 60
END
```

(f)

```
SK
PEN HOLD LLA
RW LUA 120 1
R LUA 90 1
RW LLA -180 1
R LUA 60
R LUA 90 1
RW LLA -180 1
```

(g)

```
SK
PEN HOLD LLA
REPEAT 2
R LUA 30
RW LLA 120
R LUA 150
RW LLA -120
END
```

(h)

Figure 3: Sample drawings by human motion

Phase 3: Designing

To create a design-oriented pictogram, an L command that draws a line segment by specifying coordinates is also provided. There are also options for changing the shape of the end points of the PENW command, which changes the line thickness and the PEN command. Table 3 shows the specification of these commands. And, Figure 4 shows an example program. By combining these, it is possible to draw circles and rectangles.

Table 3: The specification of PEN option, PENW and L commands

Command Format	Process
PEN arg1	The shape of line's both edges set square if arg1 is "SQUARE", set round if arg1 is "ROUND". No shape is attached at both edges if arg1 is "BUTT". As for kinds of pen, draw solid line if arg1 is "NORMAL", erase line if arg1 is "ERASE", and erase the part already drawn and draws a part not so if arg1 is "XOR".
PENW arg1	Set width of pen to arg1. (Initial state is 1)
L arg1 arg2 arg3 arg4 [arg5]	Draw line from coordinate (arg1, arg2) to coordinate (arg3, arg4) over arg5 second(s). If arg5 is omitted, then arg5 is treated as 0. The next command is executed simultaneously. But if L changes to LW then the next order is not executed until the rotation is complete.
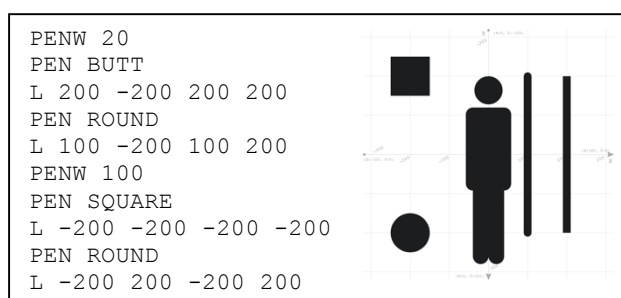
Figure 4: An example of drawing shapes

Reference colors, which indicate attention, prohibition, indication, and three kind of safety. This makes it possible to create design-oriented pictograms that are used all over the world. An example of safety sign is shown in Figure 5. Hence, it was possible to add the commands "prohibition," "attention, " "instruction," "safety," "safety green," and "safety red" mode, all of which could set only single command P, A, I, S, SG, SR respectively.

Figure 5: Color of Safety Sign

Syntonic Learning

Papert developed Logo and noted that it is very important that children can execute Logo commands by pretending to be a turtle using their own bodies; this is called "syntonic learning" [Papert 1977][Papert 1980]. Papert also noted the following:
1. Body syntonic: Strongly associated with the senses of children and knowledge of their bodies.
2. Ego syntonic: Consistent with the self-consciousness of children as humans with intention, purpose, desires, likes, and dislikes.
3. Cultural syntonic: Linked to personal activities that are firmly and positively rooted in one's culture.

The human pictogram resembles a body that represents the ego and the illustrated pictograms represent one's culture. Thus, the human pictogram conforms to these three types of syntonic learning. Figure 6 shows works that were all created by the application.

(A)	(B)	(C)	(D)	(E)	(F)
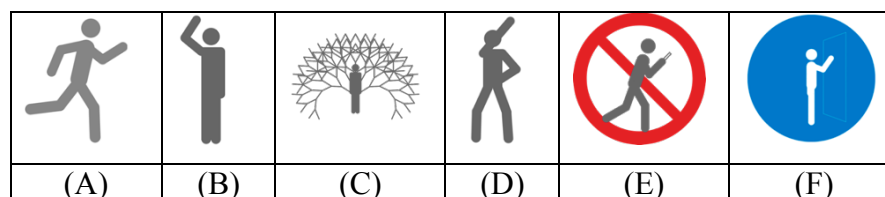
(A) Running   (B) Waving hand (C) Cupid   (D) Famous Japanese TV character's pose (E) Do not use smartphone while walking   (F) Please knock when you enter a room

Figure 6: Example of works influenced by various type of syntonic learning

Figure 6(A)–(B) shows typical human movement, created mainly based on body syntonic learning. Figure 6(C)–(D) represents artistic, humor, some major person's famous action, and so on. These pictograms are difficult to categorize, but all are based on ego syntonic. Figure 6(E)–(F) shows the pictograms linked to personal activities based on rules, morals, and culture, and some of these are widely used in one's culture. Of course, these types of syntonic learning cannot be separated clearly, but these works are based on a combination of various kinds of syntonic learning.

Practical examples

We illustrate some practical examples for using Pictogramming in classes and workshops.

(1) Class lesson style

Table 4 shows an example of 5-lessons (45 minutes each) in class from the viewpoint of learning programming concepts. In the first lesson, a lecture on the pictogram has been given to raise interest to the pictogram. The pictogram is a public sign that has deeply penetrated everyday life, and all students are familiar with it. In the last of the first lesson, they create works with multiple instructions of RW command, that is operations by simple sequential processing.

They learn sequential execution and parallel execution in the second lesson. It is easy to understand for learners because it can change to parallel execution when single character W is removed like R and RW.

They learn repetition in the third lesson. They are easy to select a theme, since repeated movements are frequently seen in human movements.

The fourth lesson is drawing with a pen on the body part. It can be transited naturally based on the learning content from the third lesson.

They create a socially used pictogram after learning commands corresponding to the thickness and type of lines and several safety signs specified by ISO in the fifth lesson.

When we think about lessons in class, it is important for each lesson to be able to achieve learning goals in predetermined time while minimizing new commands and concepts.

Table 4: An example of class lessons syllabus focuses on programming

#	Contents	Phase	min
1	1. Short lecture about pictogram		30
	2. Posing and Animation	1	15
2	1. Sequential execution and parallel execution	1	45
3	1. Looping	1	45
4	1. Human graphics	2	45
5	1. Short lecture about difference between art and design	3	10
		3	35
	2. Free work from the viewpoint of design		

Another example consisting of 5 lessons is shown in Table 5. Instead of setting a learning unit for each class as a programming learning, the purpose is to learn the difference between art and design [Ito 2019a]. Starting with pictograms lecture are the same as in the Table 5, but the second and third lessons are freely created, and examines the pictograms created by each learner in the second half of the third lesson. Explain the difference between art and design at the beginning of the fourth lesson. Here, "art" means that the creator can freely create and express the work, while the viewer can freely interpret it. On the other hand, "design" means it is important that everyone can interpret correctly. After this explanation, works are created with design in mind, and examines as before in the second half of the fifth lesson.

Table 5: An example of class lessons syllabus focuses on design edication

#	Contents	Phase	min
1	1. Short lecture on pictograms	1	30
	2. Exercise on how to operate Pictogramming		15
2	1. Free work	1,2	45
3	1. Free work (cont.)	1,2	20
	2. Competitive exhibition from the viewpoint of art	1,2	25
4	1. Short lecture about the difference between design and art	3	20
		3	25
	2. Work from the viewpoint of design		
5	1. Work from the viewpoint of design (cont.)	3	20
	2. Competitive exhibition from the viewpoint of design	3	25

(2) Workshop

Table 6 shows an example of workshops based on past experiences. As with the class lesson style, assigns time to create works freely after the lecture on pictograms and the minimum usage of the application. At the end, an exhibition is held to look other participants' work and know the background to making the work are shared with the

participants. This is just an example, and it can be changed flexibly depending on the purpose of the workshop and the facilitator that can be arranged.

Table 6: An example timetable of workshops

Contents	min
1. Short lecture on pictograms	20
2. Exercise on how to operate Pictogramming	10
3. Free work	60-80
4. Break	10
5. Competitive exhibition	20-30

Collaborative Learning between Human and Human pictogram

Now, we consider class lesson or some workshops using Pictogramming. Figure 7(1) represents a typical relationship between participants of the workshop. The human pictogram is introduced and the student starts to command or operate it (Figure 7(2)), and then begins to communicate with one's human pictogram (Figure 7(3)). Figure 7(a) is a scene using the Pictogramming application. One participant talks to another participant about his/her pictograms and mimics the movement. As the pictogram is highly visible, the participants happen to see the pictograms in the monitors naturally and acts with them. Our past research proved that posturing human shaped pictogram by this application generates humor and surreal emotions, which also promotes communications between learners. This means that one participant communicates with other participants' human pictograms (Figure 7(4)), and communicates with other participants on human pictograms (Figure 7(5)). The participants program and create numerous works with collaborative learning process [Ito 2018b].
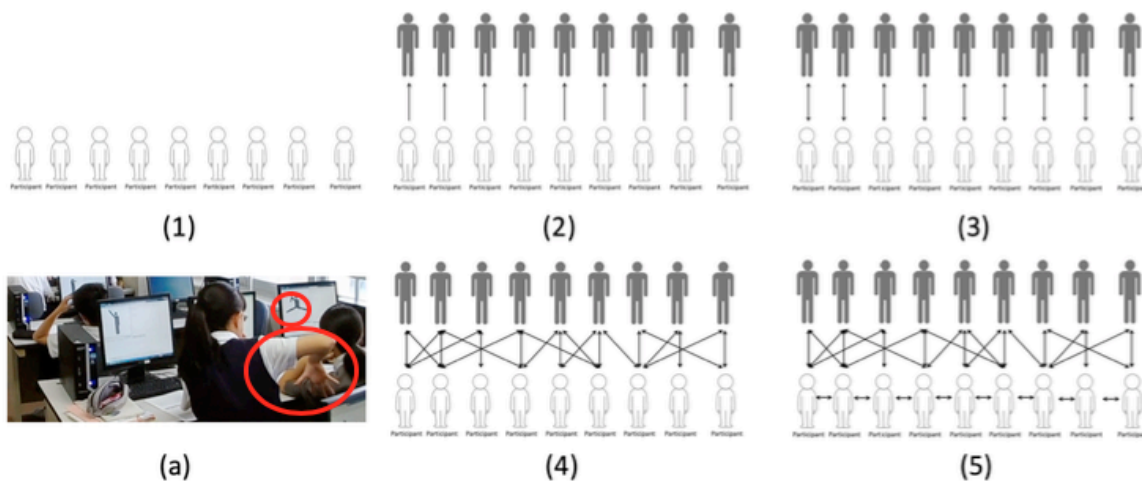
Figure 7: Construct relationship between the participants via human pictograms

Pictogramming Series

It has many extended applications based on Pictogramming. These can be used properly according to the school age and purpose when used in class lessons or workshops.

(1) Picthon

Picthon is a learning environment of Python language through pictogram content creation. Python is an interpreted language having features such as dynamic typing and multi-paradigms. Libraries are provided in a wide range of fields focusing on science and technology, such as machine learning, data science, and matrix operations.

The application is based on Pictogramming. The screenshot is shown in Figure 8. The difference point is only Python language is written in "Program code description area" and Python language is inserted by assist buttons in "Program code assist button area". This application also can be accessed at https://pictogramming.org/ .
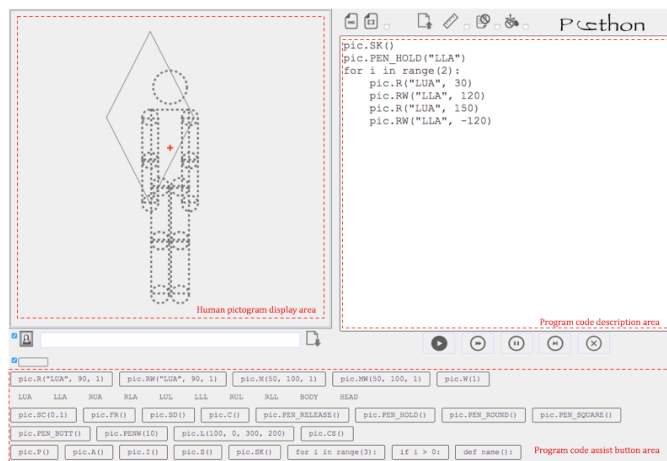
Figure 8: Screenshot of Picthon

(2) Block Pictogramming

The characteristic of Block Pictogramming is that you can create pictogram content by connecting visual blocks. And the functions are all same as Pictogramming. The screenshot is shown in Figure 9. Of course, it is designed to learn programming concepts with Block Programming. Blockly (https://developers.google.com/blockly) is used to build programs with visual blocks located in right side of the application.

This application also can be accessed from https://pictogramming.org/ .
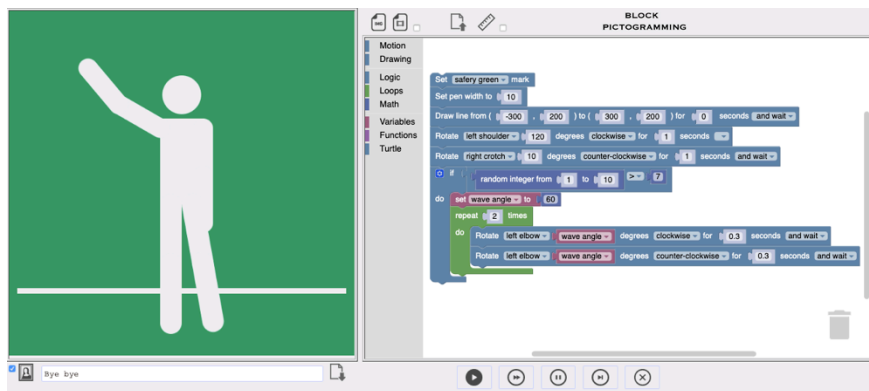
Figure 9: Screenshot of Block Pictogramming

Conclusion

This paper presents an overview of a pictogram contents creation called Pictogramming. And illustrated some key points that helps giving lectures or facilitate workshops with Pictogramming.

Acknowledgements

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Implementation of Input Methods with Natural Language for Pictogramming

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Abstract
We previously developed and released "Pictogramming." This application enables users to learn basic programming concepts by creating pictogram content. Pictogramming adopts unique commands for the purpose of educational usage. We have also released several other applications based on Pictogramming to offer various input methods. 1) "Picthon" interprets the Python language. 2) Block Pictogramming constructs programs using visual blocks. 3) Mobile Pictogramming can be used on smartphones. These could be used in class lessons or workshops according to education level and purpose. This paper proposes "Natural Language Pictogramming," which enables users to create content using English sentence input. We conducted practice sessions with this application to evaluate its effectiveness, and herein report on and discuss that evaluation.

Keywords: Pictogramming, pictogram, contents creation, programming, natural language

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1. Introduction

A pictogram is a graphic symbol that is used to represent a semantic concept based on the meaning of its shape (Ota, 1993). There are many studies of pictograms in fields such as affective engineering (Ishii & Ito, 2019), education (Ito, 2018b), intercultural communication (Mori, Takasaki, & Ishida, 2009), and semiotics (Hassan, 2017) due to globalization and the rapid worldwide increase in tourism. This is because pictograms are used internationally for symbolic expression.

A pictogram is a graphic sign that should convey meaning reliably. Therefore, the International Organization for Standardization (ISO) mainly deliberates and designs international standards for pictograms, and the appendix for ISO 3864 provides guidelines for the depiction of a human-shaped pictogram (i.e., "human pictogram"). Regardless of a pictogram's standardization, many unique pictograms can be seen in cities. For that reason, the demand for generating pictograms has increased.

Our research group has been developing "Pictogramming" ("Pictogramming," 2017), which is a pictogram authoring tool. Pictogramming is based on two words: "pictogram" and "programming," and it is also used as a programming learning tool for beginners (Ito, 2018a).

Pictogramming has been used by many people from elementary school students to adults to learn programming and to create content in workshops and schools. Pictogramming uses a unique format for commands. We have also released several other applications based on Pictogramming to provide various input methods. 1) "Picthon" can interpret the Python language. 2) "Block Pictogramming" constructs a program with visual blocks. 3) "Mobile Pictogramming" can be used on smartphones. These can be used properly according to the school age and purpose when used in class lessons or workshops. In this paper, we call Pictogramming without an extension "standard Pictogramming."

We propose "Natural Language Pictogramming" in this paper. It allows users to input Pictogramming's command format with English sentence input. We conducted a practice session with 35 Japanese high school students to confirm the effect of Natural Language Pictogramming. In this paper, we summarize our proposal and discuss the results of the practice session.

2. Pictogramming

2.1 Overview

Pictogramming is a web application that is implemented using HTML5, CSS, and JavaScript. Therefore, Pictogramming is not only easy to access using a Web browser, but also easy to extend.

2.1.1 Screen structure

Figure 1 is a screenshot of the Pictogramming when it is accessed through a PC browser.

Pictogramming is configured using three main areas. In Figure 1, area (A) is the human pictogram display panel, which displays a large human pictogram. Area (B) is the program code description area, and operations on the human pictogram are input and defined in this area. Area (C) is the list of buttons to input support commands, and the description of the program in the program code description area can be completed by clicking the buttons, which aims to reduce the burden of input. Pictogramming also has many buttons. Button (a) is used to run the program that is written in the program code description area. The program also runs when the return key is pressed if box (b) is unchecked. The program code can be saved when button (c) is pressed. The screen image of area (A) can be saved as a PNG image when button (d) is pressed. Animation content can be saved as GIF animation when button (e) is pressed. The saved filename is determined by the value in text field (f).
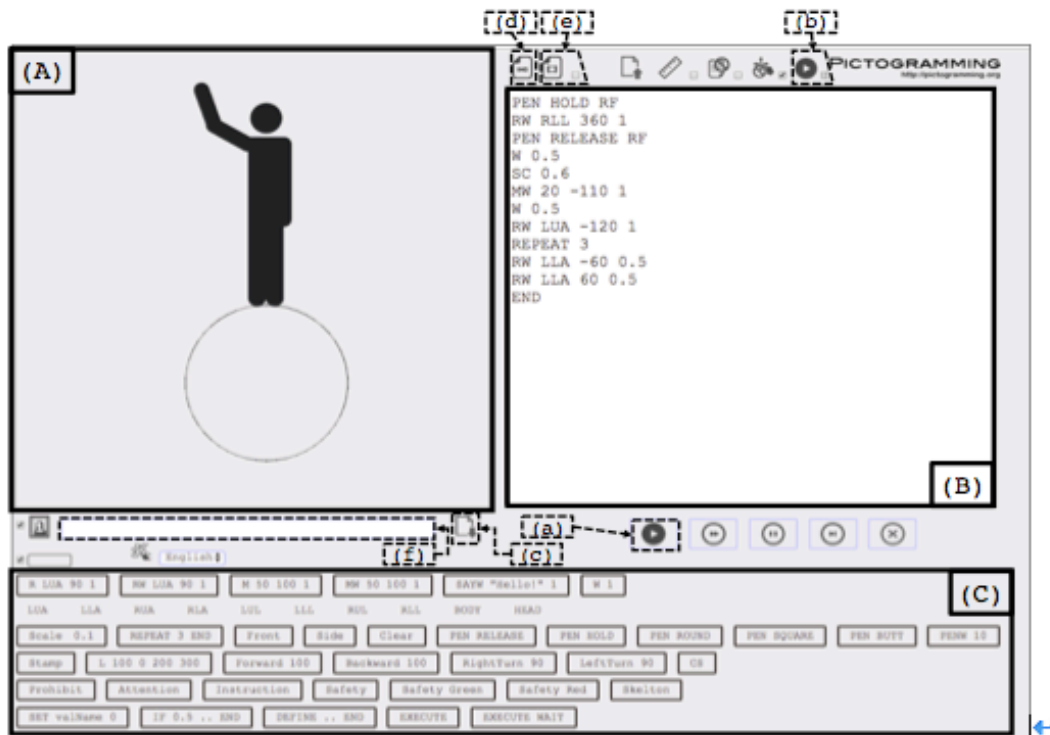
Figure 1: Screenshot of Pictogramming

2.1.2 Command format and content example

Command input in the program code description area follows the format in Figure 2. "Opcode" means operation code. The opcode and arguments are separated by a space.

```
opcode arg1 arg2 ……
```

Figure 2: Command format

Table 1 shows the commands that are mainly used when creating content. By combining the commands in Table 1, pictogram animation content, pictogram graphics content, and combined animation and graphics content as shown in Figure 3 can be created. Pictogram animation content are works that express change in a human pictogram's movement using mainly R, RW, M, and MW commands, and pictogram graphic content are works that show the movement path of a human

pictogram by mainly using the `PEN`, and `L` command. Figure 4 shows sample code that can create content with combined animation and graphics, shown on the right side of Figure 3. Also, a safety sign can be created using the six commands shown from line 16 (`P` command) to the last line (`SR` command) in Table 1. Figure 5 shows examples for each mode.

Table 1: Main commands used to create content

Command format	Process
`R   arg1   arg2 (arg3)`	Rotate `arg1`, a part of the body, `arg2` degrees counterclockwise over `arg3` seconds. If `arg3` is omitted, `arg3` is treated as ″0″.
`RW   arg1   arg2 (arg3)`	Rotate `arg1`, a part of the body, `arg2` degrees counterclockwise over `arg3` seconds. The next command is not executed until the movement is complete. If `arg3` is omitted, `arg3` is treated as ″0″.
`M   arg1   arg2 (arg3)`	Move `arg1` pixels in an X-axis positive direction and `arg2` pixels in a Y-axis positive direction with linear uniform motion over `arg3` seconds. If `arg3` is omitted, `arg3` is treated as ″0″.
`MW   arg1   arg2 (arg3)`	Move `arg1` pixels in an X-axis positive direction and `arg2` pixels in a Y-axis positive direction with linear uniform motion over `arg3` seconds. The next command is not executed until the movement is complete. If `arg3` is omitted, `arg3` is treated as ″0″.
`W arg1`	Wait `arg1` seconds. The next command is not executed until the wait is complete.
`PEN arg1 (arg2)`	Release pen if `arg1` is "RELEASE." Hold pen if `arg1` is "HOLD." A part of body can be set as `arg2` to set the location of releasing or holding the pen only if `arg1` is "RELEASE" or "HOLD". If `arg2` is omitted, it is considered to be set to "BODY".
`PENW arg1`	Set width of pen to `arg1`. (Initial state is "1.")
`L   arg1   arg2 arg3 arg4`	Draw line from coordinate (`arg1`, `arg2`) to coordinate (`arg3`, `arg4`).
`REPEAT arg1`	Execute until `END` command `arg1` times.
`END`	End of `REPEAT` statement block.
`SC arg1`	Change scale to `arg1` time(s) from current size.
`FD`	Switch the human pictogram to the front direction. (Initial state is front direction.)
`SD`	Switch the human pictogram to the side direction.
`SK`	Change to skeleton mode if current mode is not Skeleton mode. Change to normal mode if current mode is Skeleton mode.
`P`	Change to prohibit mode.
`A`	Change to attention mode.
`I`	Change to instruction mode.
`S`	Change to safety mode.
`SG`	Change to safety green mode.
`SR`	Change to safety red mode.
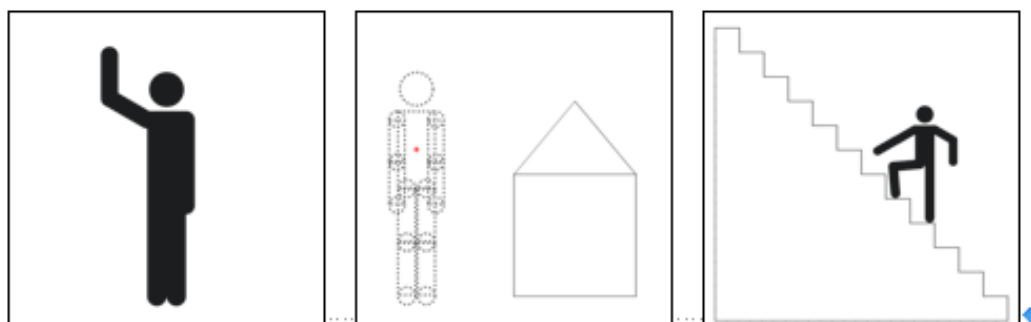
Figure 3: Pictogram animation content (left side), pictogram graphics content (center), and combined animation and graphics content (right side)

```
01    SK
02    MW -300 -250 0.5
03    PEN HOLD
04    MW 0 600 0.5
05    MW 600 0 0.5
06    REPEAT 12
07    MW 0 -50 0.2
08    MW -50 0 0.2
09    END
10    PEN RELEASE
11    SC 0.5
12    MW 430 240 0.5
13    SK
14    R LC -85 0.6
15    R LK 90 0.6
16    R LS -60 0.6
17    R RS 60 0.6
18    R RE -60 0.6
```

Figure 4: Code for the right side of Figure 3

Figure 5: Color of safety sign

Next, the names of the parts that are used in the commands for the human pictogram are described. The movement decisions and the status of the human pictogram are determined by designating body parts or joints. The left and right sides of Figure 6 show the names of the body parts for a human pictogram facing front. The left and right sides of Figure 7 show the names of body parts for a human pictogram facing to the side.
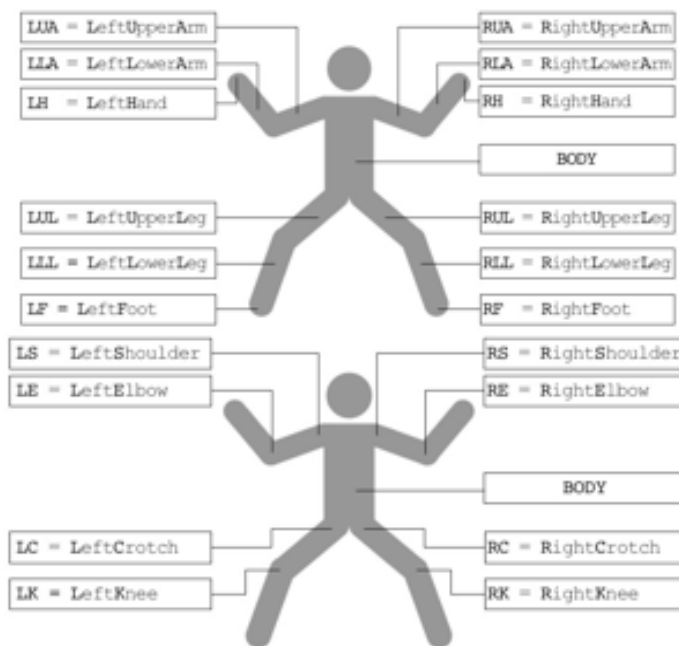
Figure 6: Names of body parts and joints (front direction)
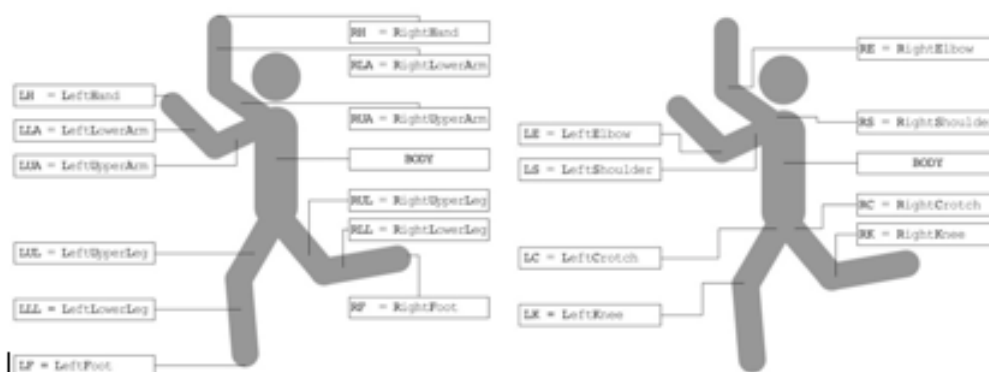
Figure 7: Names of body parts and joints (side direction)

2.2 Pictogramming series

We have developed extensive applications. To distinguish between applications, we named this application "standard Pictogramming," as mentioned in Section 2.1.

2.2.1 Picthon

Picthon (Ito Lab., 2019a) is a version of Pictogramming, in which content using a human pictogram can be created in Python. Figure 8 shows a screenshot of Picthon.
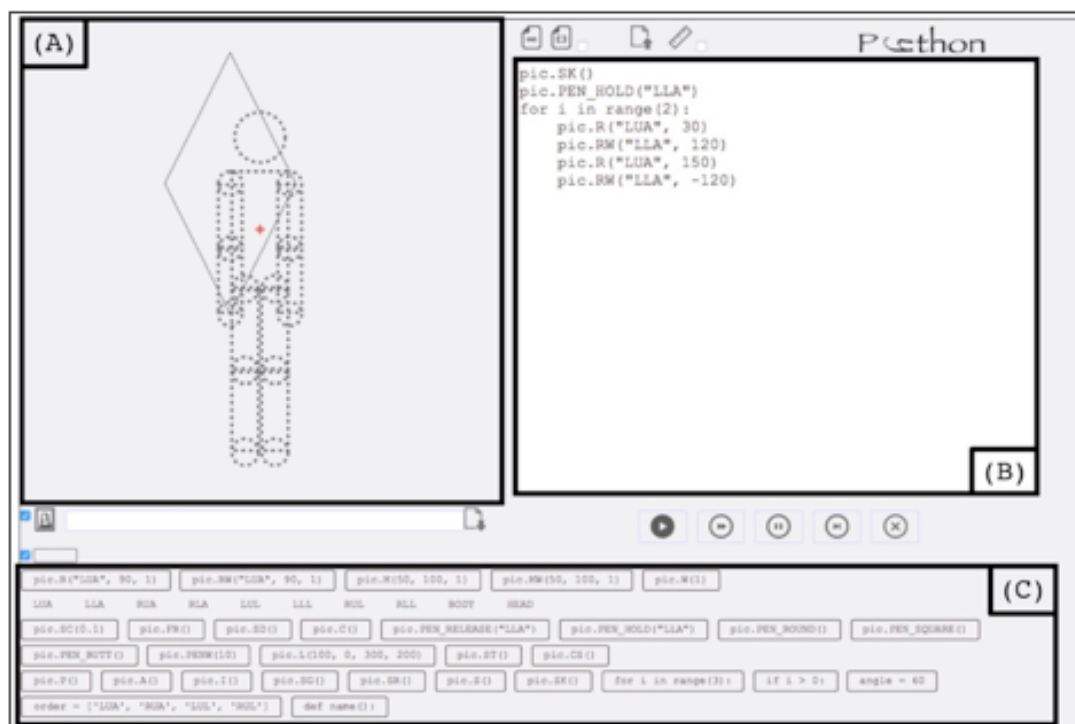
Figure 8: Screenshot of Picthon

The interface is almost the same as the standard Pictogramming, and the placement of the three main areas (Figure 8 (A), (B), and (C)) is the same as in the standard Pictogramming. The only difference between Picthon and the standard Pictogramming is that the codes written in the program description area (Figure 8 (B)) are written in Python. Naturally, the text string that is input by clicking on the buttons for supporting command input is a Python program string. Figure 9 shows an example of a program in Picthon.

```
01    pic.SK()
02    pic.PEN_HOLD("LLA")
03    for i in range(2):
04        pic.R("LUA", 30)
05        pic.RW("LLA", 120)
06        pic.R("LUA", 150)
07        pic.RW("LLA", -120)
```

Figure 9: Sample code for Picthon

2.2.2 Block Pictogramming

Block Pictogramming ("Block Pictogramming," 2019b) is a block-type visual programming version for Pictogramming. Figure 10 is a screenshot of Block Pictogramming. The interface is almost the same as standard Pictogramming, and two out of the three main areas (Figure 10 (A) and (B)) shown are the same as in standard Pictogramming. In addition, Area (B) is a drawing by Google Blockly. Google Blockly is a library to help develop block typed programming language (Google Developers, n.d.). It is open-source product, therefore lots of research projects which

uses Blockly has been reported (Marron, Weiss, & Wiener, 2012). There is no Area (C)–the list of buttons for supporting command input—because the blocks play the same role as the buttons, and the commands are input by selecting a block from Area (B'), which is the list of blocks. The difference from standard Pictogramming is that the program is constructed using blocks. Figure 11 shows an example of a program string in Block Pictogramming.
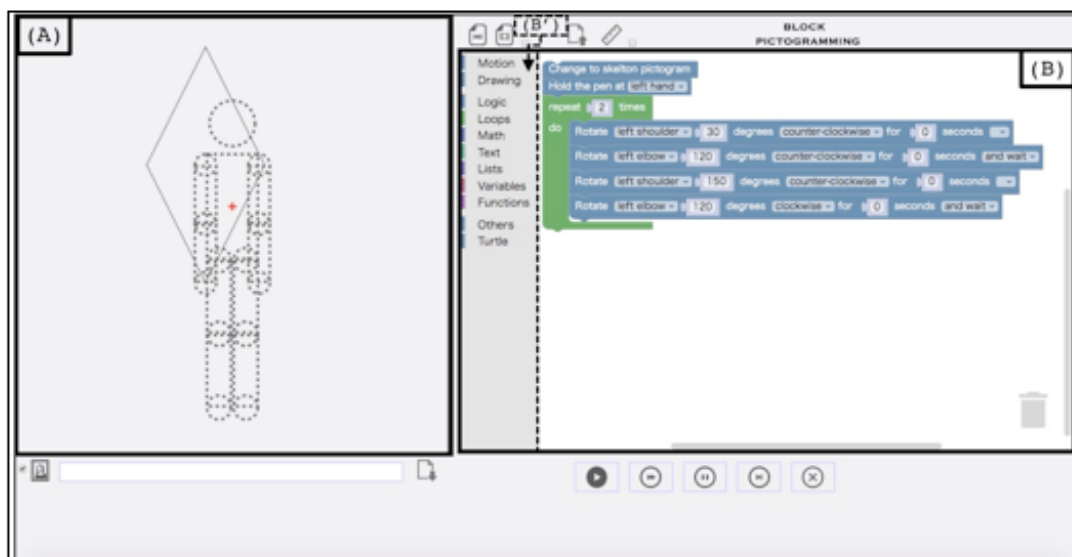
Figure 10: Screenshot for Block Pictogramming
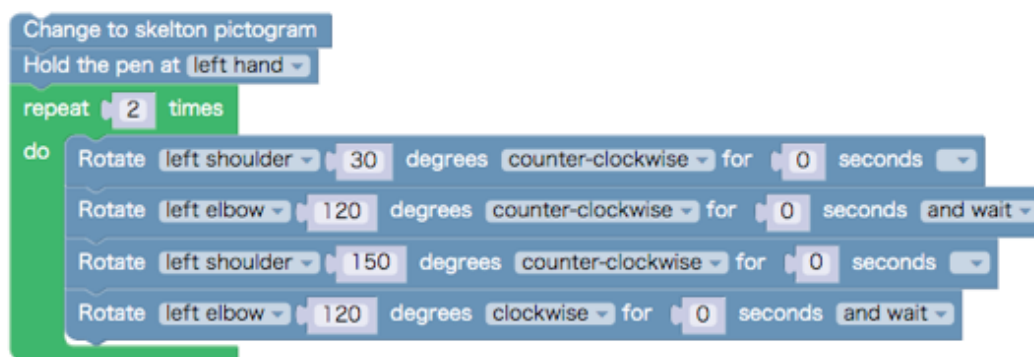
Figure 11: Sample code for Block Pictogramming

2.2.3 Mobile Pictogramming

Mobile Pictogramming ("Mobile Pictogramming," 2018) is smartphone version of Pictogramming. It is easy to adapt to a smartphone because it is web application implemented with HTML5, CSS, and JavaScript (Ito, 2019). On the left side of Figure 12 is a screenshot of the Mobile Pictogramming application from a browser on an iOS device. However, the three main areas ((A): the human pictogram display panel; (B): the program code description area; and (C): the list of buttons for supporting commands input) are arranged vertically due to the differences in the interface and display area from a PC (see the right side of Figure 12).
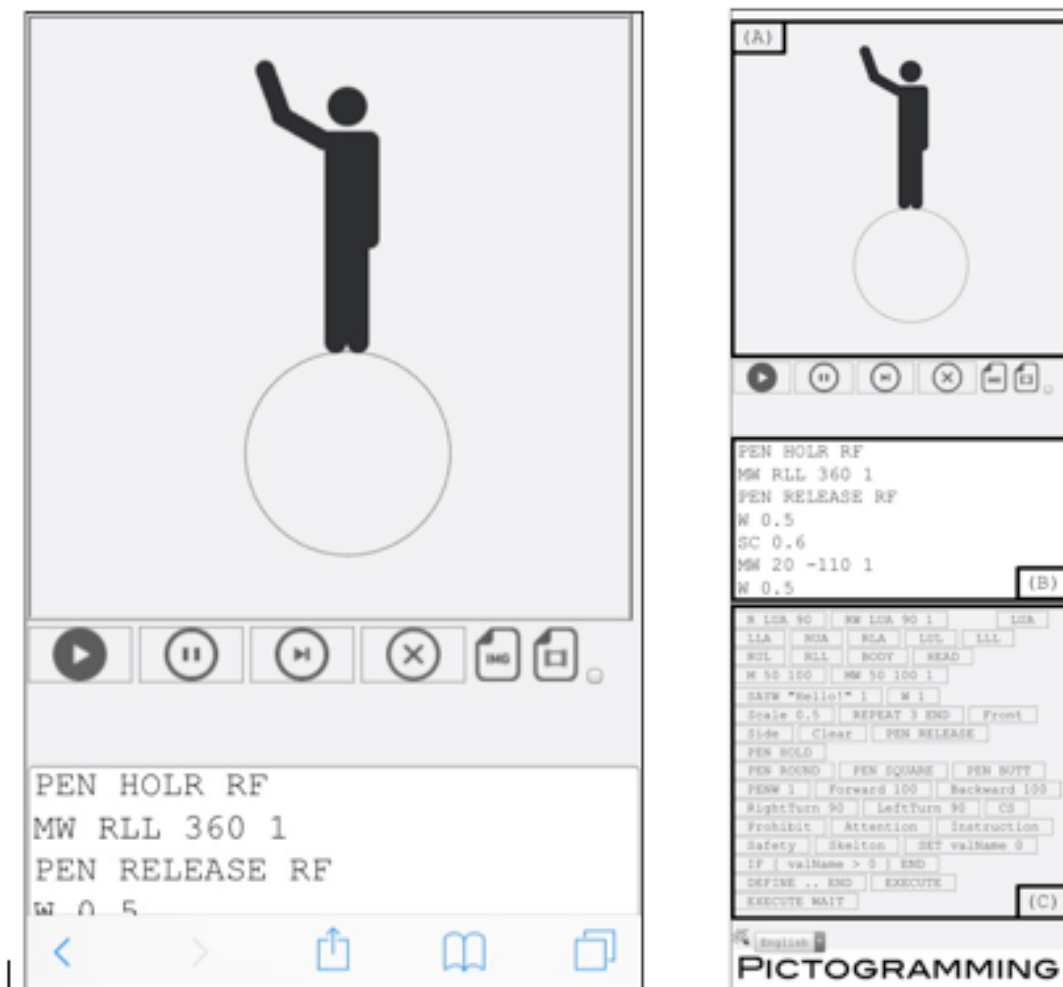
Figure 12: Screenshot of Mobile Pictogramming

The screen layout is optimized for a smartphone, but all commands that are shown in Table 1 of Section 2.1.2 can be used. Of course, the content can be saved as text, PNG image, and as GIF animation in the same way as with standard Pictogramming.

3. Natural Language Pictogramming

3.1 Screen structure

Figure 13 is a screenshot of Natural Language Pictogramming using a PC browser. The interface is almost the same as standard Pictogramming.
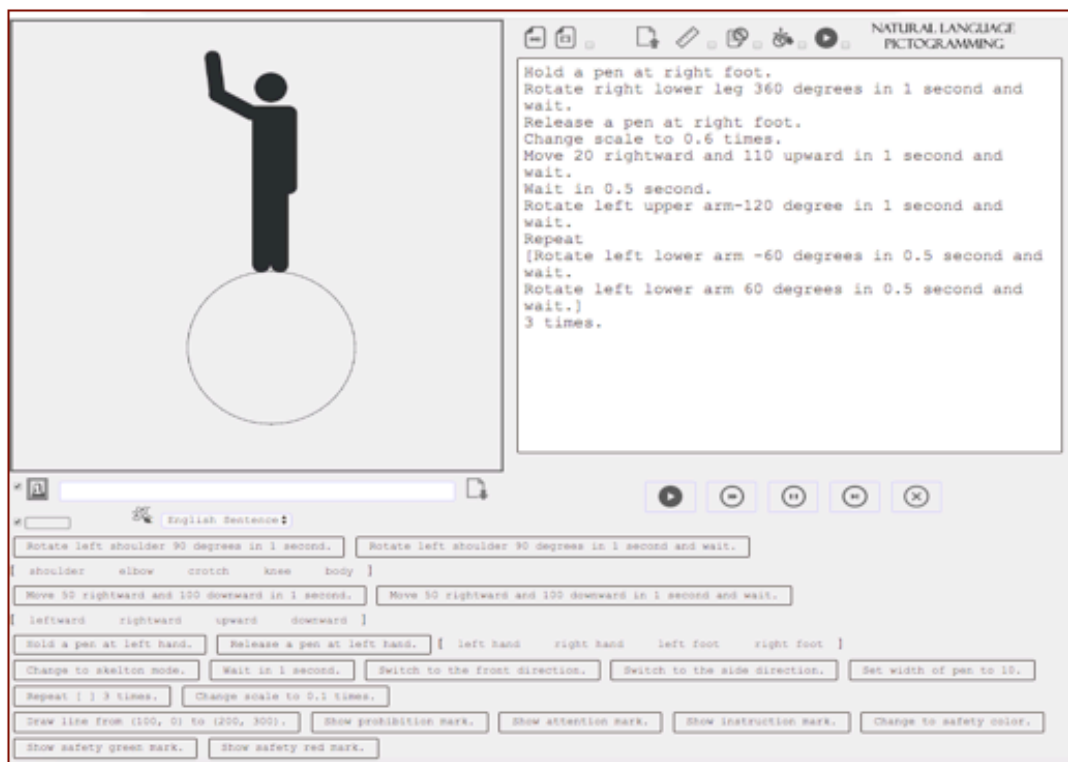
Figure 13: Screenshot of Natural Language Pictogramming

3.2 Example of command input

Natural Language Pictogramming supports input using natural sentences for all the commands in Table 1 in Section 2.1.2. Table 2 shows the command format in Natural Language Pictogramming. The buttons for the supporting command input show an example sentence using the command format in Table 2. Figure 14 shows the display with the buttons for supporting command input. The end of a command is expressed by adding a "." (period) on the termination of the command, as shown in Table 2, or by inserting "return" on the termination of the command. Both "." and the "return" are available.
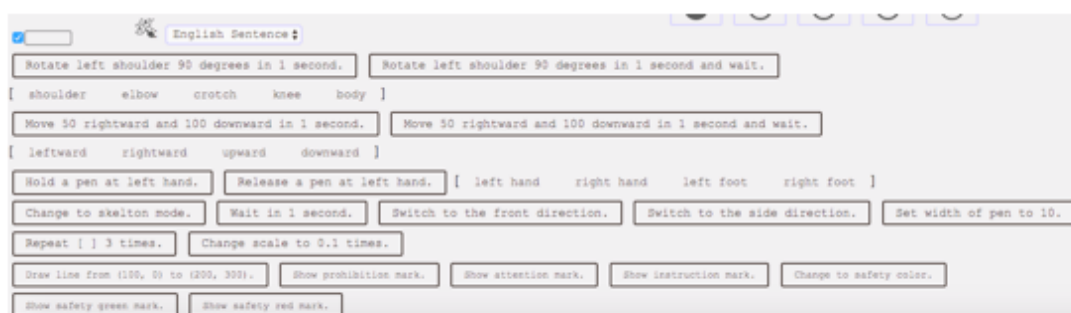
Figure 14: Buttons for supporting command input in Natural Language Pictogramming

Table 2: Command input format using natural sentences

Commands format in standard Pictogramming	Input way in Natural Language Pictogramming
`R arg1 arg2 (arg3)`	`Rotate arg1 arg2 degrees in arg3 seconds.`
`RW arg1 arg2 (arg3)`	`Rotate arg1 arg2 degrees in arg3 seconds and wait.`
`M arg1 arg2 (arg3)`	`Move arg1 leftward and arg2 downward in arg3 second.`
`MW arg1 arg2 (arg3)`	`Move arg1 leftward and arg2 downward in arg3 seconds and wait.`
`W arg1`	`Wait in arg1 seconds.`
`PEN arg1 (arg2)`	`arg1 a pen at arg2.`
`PENW arg1`	`Change scale to arg1 times.`
`L arg1 arg2 arg3 arg4`	`Draw line from (arg1, arg2) to (arg3, arg4).`
`REPEAT arg1` *The command repeated* `END`	`Repeat` [*The command repeated*] `arg1 times.`
`SC arg1`	`Change scale to arg1 times.`
`FD`	`Switch to the front direction.`
`SD`	`Switch to the side direction.`
`SK`	`Change to skeleton mode.`
`P`	`Show prohibition mark.`
`A`	`Show attention mark.`
`I`	`Show instruction mark.`
`S`	`Change to safety color.`
`SG`	`Show safety green mark.`
`SR`	`Show safety red mark.`

Various movements in human pictograms can be constructed using the buttons for supporting command input shown in Figure 14 because the buttons in Natural Language Pictogramming show the unit such as second and degree. For instance, when a user who cannot understand the command format in standard Pictogramming thinks "I want to make human pictogram move 50 pixels leftward and 10 pixels upward in 1 second," the person can input command by referring the button "`Move 50 leftward and 100 downward in 1 second.`"

Natural Language Pictogramming also supports an input format other than the display of the buttons for supporting command input. For instance, word order, and another expression that is different from those of the buttons for supporting command input are available as input formats. Table 3 shows an example of some input formats that is different from the buttons for supporting command input, so other word orders and expressions are also available.

Table 3: Input examples using natural sentences

The display buttons for support command input	Input examples other that the display buttons for supporting command input
`Rotate left upper arm 90 degrees in 1 second.`	· `Rotate left shoulder 90 degrees to clockwise in 1 second.` · `Rotate left upper arm -90 degrees to anticlockwise in 1 second.`
`Rotate left upper arm 90 degrees in 1 second and wait.`	· `Rotate left shoulder 90 degrees to clockwise in 1 second and wait.` · `Rotate left upper arm -90 degrees to anticlockwise in 1 second.`
`Move 50 leftward and 100 downward in 1 second.`	· `Move 100 downward and 50 leftward in 1 second.` · `Move -50 rightward and -100 upward in 1 second.`
`Move 50 leftward and 100 downward in 1 second and wait.`	· `Move 100 downward and 50 leftward in 1 second and wait.` · `Move -50 rightward and -100 upward in 1 second and wait.`
`Wait in 1 second.`	· `Wait for 1 second.` · `Wait 1 second.`

3.3 The processing procedure

The input sentences are converted to the command format in Table 1 of Section 2.1.2 and are executed. The summary of the conversion procedure is presented from «Step 1» to «Step 5».

«Step 1» The text strings that were input are separated by periods to divide the text strings into sentences. The conversion is done per sentence.
«Step 2» The words for operation code, unit (degree, second, and so on), and digit (value of second, value od degree, and so on) are extracted from the sentences that were input. The words for unit, number, and their locations are also identified.
«Step 3» The sentence that was input is converted to the command format of standard Pictogramming based on the results of «Step 2».
«Step 4» In case of the `REPEAT` command, the conversion in «Step 3» is not done correctly because `REPEAT` commands are input using `"[ ]"` (brackets). Therefore, the locations of the brackets are identified. Based on the locations, the word order could be switched.
«Step 5» The commands are run based on the results until «Step 4» is reached.

3.4 Overview of the practice

3.4.1 Purpose

The practice was carried out to survey whether it was easy to use the input in Natural Language Pictogramming. Participants created real content by using the implementation that was released. Then, we asked them to answer the questionnaire.

3.4.2 The participants

The practice involved 35 fourth-grade students from Kobe University Secondary School (equivalent to the first grade of senior high school). The participants had learned standard Pictogramming in the year 2018 and learned Picthon in November 2019. The practice was done on November 25 (Monday) in a classroom. All lessons were 50 minutes long.

In addition, the practice only allowed the participants to use basic commands for pictogram content creation because we wanted to evaluate the ease of use solely for sentence input. Therefore, the practice did not allow the participants to use the L command or to allow them to create complex content.

3.4.3 Procedure

Table 4 shows a summary of the practice procedure. In the "Content" column in Table 4, the contents which was done in the class is ordered in time. In the practice, the handout was used. The handout gave three exercises to the participants. The code as first exercise is shown in Figure 15, and second exercise is shown in Figure 16. The participants make free contents as third exercise.

Table 4: Timetable of the lesson

Content	Time (minutes)
・ Greeting	1
・ Startup computers, and guide to web page	3
・ Explain the summary for Natural Language Pictogramming	2
・ Distribute handouts	2
・ Explain application overview by using the buttons for supporting command input	2
・ Practice to make programs shown in the handout	30
・ Answer the questionnaire	10

```
01  Rotate left upper arm –120 degrees in 0.8
    second and wait.
02  Repeat
03  [Rotate left lower arm –60 degrees in 0.4
    second and wait.
04  Rotate left lower arm 60 degrees in 0.4 second
    and wait.]
05  3 times.
```

Figure 15: Code as first exercise

```
01  Move 40 leftward and 100 upward in 1 second and
    wait.
02  Change to skeleton mode.
03  Hold a pen at right foot.
04  Rotate right upper leg 360 degrees in 1 second.
```

Figure 16: Code as second exercise

3.5 Practice results and consideration

This section presents the results from an analysis of the practice. The analysis was based on a questionnaire evaluation, observing the participants while they were creating, and data that were logged while participants were creating.

The questionnaire asked the participants about four things that are shown in Table 5. From question 1 to question 3, six options were offered. The options were: 6-very easy to use; 5-easy to use; 4-if anything, easy to use; 3-if anything, hard to use; 2-hard to use; and 1-very hard to use. In question 4, the format of the answer was open ended.

Table 5: Content of the questionnaire

#	Content
1	Please evaluate the usability of input by natural sentences, which was implemented this time.
2	Please evaluate the usability of input by Picthon, which you used this month.
3	Please evaluate the usability of input by words with a separator, which you used in the previous school year.
4	Open ended: Input by natural sentences is available this time. Please describe your opinions and feelings about this function.

First, Table 6 shows the results of Q.1 to Q.3. The mean value for Natural Language Pictogramming is more than the mean value for standard Pictogramming, but it is less than the mean value for Picthon. Also, a T-test was done based on the null hypothesis that there was no difference between Natural Language Pictogramming and standard Pictogramming, but no significant difference was found (p = 0.3789).

Table 6: Results from Q.1 to Q.3

	1	2	3	4	5	6	mean	SD
Q.1 (for Natural Language Pictogramming)	0	0	12	10	7	6	4.200	1.106
Q.2 (for Picthon)	0	0	3	16	10	6	4.543	0.886
Q.3 (for standard Pictogramming)	0	4	7	9	11	4	4.114	1.143

Second, Figure 17 shows excerpts of answers to Q.4.

The results of the analysis based on the questionnaire evaluation, participant observation, and the data log is described below.

There were answers similar to A), B), and C), saying that they felt the input by English sentences was easy to understand because it did not use abbreviations, and everyone could create content even if they did not know the command format or the abbreviations for the command name. Then, even if the movement of the human pictogram differed from their thinking, there were many events that could be solved by discussion in the participants. The participants confirmed whether there is no error about the program grammar each other. The program grammar is English sentence, so confirmation was done easily. Therefore, it was thought that content creation was easier using input in natural sentences to a certain degree.

There were answers such as D), saying that they felt that learning a programming language was important using natural sentence input. Therefore, using Natural Language Pictogramming before standard Pictogramming and Picthon may generate learning effectiveness.

On the other hand, there were answers such as E), F), and G), saying that Natural Language Pictogramming was troublesome because it required input in long sentences. In practice, there were many participants who were not used to typing English, so it seemed difficult for them to input using English.

A) Thank you for teaching about official names. I did not know the meaning of the abbreviations. Natural Language Pictogramming was fun. It took a long time to read the content of the buttons, but it was easier to understand the meanings in Natural Language Pictogramming than in Picthon or standard Pictogramming. I was also able to learn English vocabulary.

B) Natural Language Pictogramming is good because I can easily imagine the movement of a human pictogram. If I could get used to inputting English words, I think I could use it more easily.

C) Natural Language Pictogramming is very easy to use. When I used Picthon before, I had to know about programming grammar. In Natural Language Pictogramming, I can input commands using only knowledge of English. In addition, I have the opportunity to learn English by using English sentences.

D) When I used standard Pictogramming and Picthon, I had no idea of the significance of learning a programming language. However, it was difficult to input English, so I was able to learn about the importance of a programming language through Natural Language Pictogramming.

E) The input method when I used Picthon was easier than this software.

F) This lesson was difficult for me.

G) The input using Picthon was easier than using English because English sentences are long and complicated. However, I thought programming in English was better for learning English words.

Figure 17: Excerpts of answers to Q.4

4. Conclusion

In this study, we proposed Natural Language Pictogramming, which constructs codes from natural language for pictogram content creation. We reported on the evaluation of a practice session but analyzed it only from the viewpoint of usability. Therefore, we plan to conduct further practice sessions to compare Natural Language Pictogramming with standard Pictogramming and Picthon from the viewpoint of learning effects.

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The Effect of Foreign Language on Moral Decision Making

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Abstract

Would you sacrifice one person to save a group of five people? This kind of moral dilemma juxtaposes deontological ethics against consequentialism. It presents the problem of balancing doing what is right against the common good. Such morality forms the foundation of our identity as citizens. However, does this morality change when the problem is posed in a different language? This has been the focus of recent research into the effects of the Foreign Language Effect on moral judgement (MFLE). This experiment examined whether and how the MFLE affects moral judgement of non-native speakers of English. The findings suggest that foreign language does influence moral decision making. Moreover, there was evidence supporting the hypothesis that a problem presented in a foreign language attenuates cognitive functioning toward the deliberation of consequences rather than blunting the emotional and moral reactions to right and wrong. Such findings have a wider social implication, particularly in an increasingly globalized world where individuals often engage in decision-making involving communication in a foreign language.

Keywords: foreign language effect, psychology, decision making

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Introduction

Would you sacrifice one person to save the lives of five other people? Most people would answer "yes" citing that "the needs of the many outweigh the needs of the few". Hopefully you will never have to come across a situation where you have to make this kind of choice. However, as a thought experiment, such scenarios offer a glimpse at the tension between individuals' deontological values—what people hold to be intrinsically right and wrong—and utilitarian choices—actions which promote the greater good. By doing so we can better understand what constitutes "morality".

Morality is an intrinsic part of our individuality. It guides us in our daily interactions and informs our outlook of the world around us. Yet, how intractable is morality? Though moral choices depend on various contextual factors, it would seem natural to believe that, as long as individuals understand the situation, moral decisions would remain constant regardless of the language being used. However, recent research has demonstrated that foreign language significantly affects moral decision making outcomes. To better understand this, an exploratory study was conducting with Japanese university students studying English.

First and second-year students attending a Japanese university were asked to participate. Based primarily on accessibility (scheduling) and course of study (English language track), a sample size (n=85, 95%, CI=-10/10) was determined (43 female, 42male; Mage=18.5, age range=18-19 years). The English level of the participants was determined to be pre-intermediate (CEFR B1, range A1-B2) determined by examining their TOEIC scores (Mscore= 442.6, range 375-575).

Following previous research (Costa, et al., 2014; Geipel, Hadjichristidis, & Surian, 2015), students were presented with versions of the classic trolley dilemma and a modified dilemma in their native language(L1), Japanese and a foreign language (L2), English. One group was assigned to the control group, native language (L1) condition (n=42, 21 female, 21 male, Mscore= 441.4), while the remainder were assigned to the foreign language (L2) condition (n=43, 21 female, 21 male, Mscore= 442.9). Participants were presented with moral dilemmas (see Appendix A), each with a choice involving the death of an individual in order to save five. The dilemmas were translated and back-translated by native language speakers to ensure consistency. The presentation of dilemmas were counterbalanced, delivered entirely in Japanese (L1) or English (L2). Participants had to choose to do the action and select YES (i.e., but would save five other people. pulling a switch, diverting course) or select NO and do nothing. Participants were also asked to sketch the problem to demonstrate their understanding. Non responses, unintelligible responses or responses with no sketch were removed from the final analysis.

Native language (L1) condition. This group was presented with the trolley problem in their native language and reported similar results (see figure 1) to previous findings (Geipel, Hadjichristidis, & Surian, 2015) . 59% of participants chose to sacrifice the life of one person to save the lives of five others (utilitarian processing, UP) while 41% decided that it was better to do nothing (deontological processing, DP) and let the trolley follow its course (α=0.89). Costa et al. (2014) suggested that people struggled with compromising their deontological belief that it is "morally wrong" to take a life (p. 2).
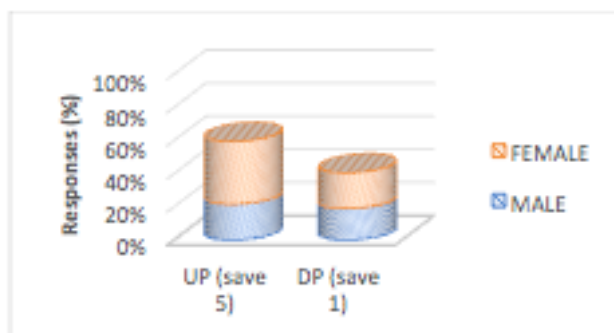
Figure 1 Trolley Dilemma (L1 Condition)

Foreign language (L2) condition. This group was presented with the trolley problem in English, their foreign language (L2). There was a 17 percentile point increase when presented with the same dilemma in a foreign language (L2). 76% of students chose the more utilitarian option of sacrificing one person to save five others, while only 24% chose to do nothing ($\alpha=0.89$, see figure 2). This 17% increase is in-line with other studies. For example, Costa et al. (2014) reported 13 to 26 percentage point increases in utilitarian choices between mother tongue (L1) and foreign (L2) language (p. 3).
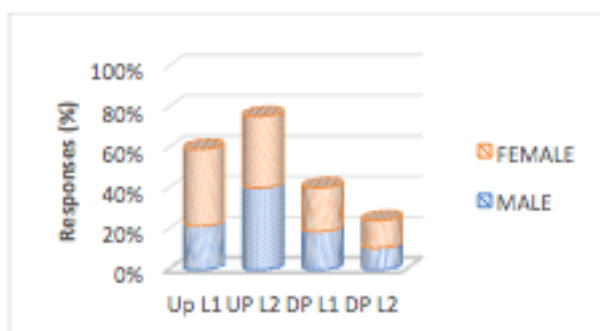
Figure 2 Trolley dilemma (L1 v. L2)

The foreign language condition group was also given an additional moral dilemma to verify that there were no biases associated with the group. The dilemma was a variation of the trolley dilemma and presented in Japanese (L1). Not surprisingly, the group reported similarly to the native language condition, with 62% reporting that they would sacrifice one person to save five others (figure 3).
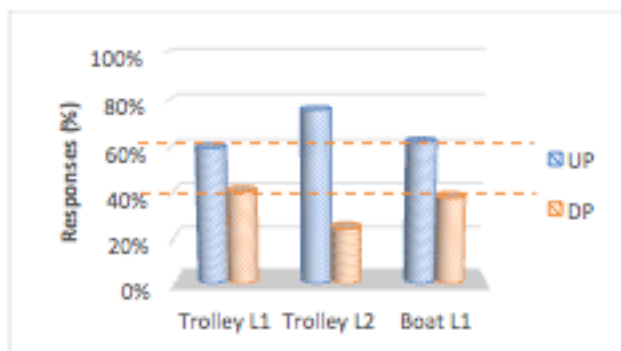
Figure 3 Trolley-Boat Dilemma

Conclusion

This preliminary investigation showed that indeed there was a significant difference (p=0.022) between moral decisions when the dilemmas were presented in learners' L1 and L2. Between group analysis showed that the decisions between the control and test group in L1 were quite similar (p=0.003). This lends support to the MFLE hypothesis that foreign language affects how individuals process decisions.

It is generally believed that moral judgement is driven by two forces or systems of moral decision making: an automatic almost immediate and intuitive system and a more effortful, slower and evaluative system (Costa, et al., 2014; Dwyer, 2009; Hayakawa, Tannenbaum, Costa, Corey, & Keysar, 2017; Keysar, Hayakawa, & Gyu An, 2012). Deontological choices, such as "do not harm people" are driven primarily by System 1 processes while utilitarian or consequential choices, the idea of "the greater good", are supported by System 2 processes.

One theory, blunted deontology , suggests that the emotional (System 1) connections and heuristics are dampened when using a foreign language (Geipel, Hadjichristidis, & Surian, 2015; Hayakawa, Tannenbaum, Costa, Corey, & Keysar, 2017; Toivo, 2017; Costa, et al., 2014). This idea that a foreign language has less emotional resonance has been widely studied and supported. Memories are encoded within a linguistic context and is dilated when filtered through a second language (Geipel, Hadjichristidis, & Surian, 2016).

Another theory, heightened utilitarianism, suggests that using a foreign language forces the individual to think in a more deliberative way. There is the notion that the extra cognitive load that results from process a foreign language limits available cognitive resources, resulting in slower, more deliberate and analytic choices (Costa, et al., 2014) (Geipel, Hadjichristidis, & Surian, 2015) (Keysar, Hayakawa, & Gyu An, 2012). There is also the idea of heightened systematicity, which suggests that using a foreign language primes the brain to think systematically (Geipel, Hadjichristidis, & Surian, 2015; Keysar, Hayakawa, & Gyu An, 2012).

Observations and follow-up interviews with randomly selected participants tended to point toward the fact that the decision making process was affected more by either heightened utilitarianism or heightened systematicity, rather than a blunted deontology. In informal follow up interviews with participants, there was general agreement that dilemmas presented in either L1 or L2 were equally difficult in terms of emotion. In addition, during the activity, it was observed that participants tended to take longer when responding in a foreign language (L2) than when using their mother tongue (L1). There was also a general tendency for participants to consult either the instructor or peers when using L2. Participants asked such questions as "Do I know these people?" or "Can I save both?" in L2 but not in L1. In fact, when using L1, participants tended to come to a decision and compare their decisions with those of their peers, where participants wanted more information and sought advice from peers before coming to decision when using L2

Understanding the exact processes involved is the next logical step to understanding and leveraging the foreign language effect. What do individuals notice or focus on between L1 and L2? What regions in the brain are activated? To what degree does

the foreign language effect impact more "real life" problems? These are questions that I hope future research attempts to answer.

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Appendix

Dilemmas Presented (English version)

Classic Trolley Dilemma

There is a runaway trolley barreling down the railway tracks. Ahead, on the tracks, there are five people tied up and unable to move. The trolley is headed straight for them. You are standing some distance off in the train yard, next to a lever. If you pull this lever, the trolley will switch to a different set of tracks. However, you notice that there is one person on the side track. You have two options:

Do nothing and allow the trolley to kill the five people on the main track.

Pull the lever, diverting the trolley onto the side track where it will kill one person.
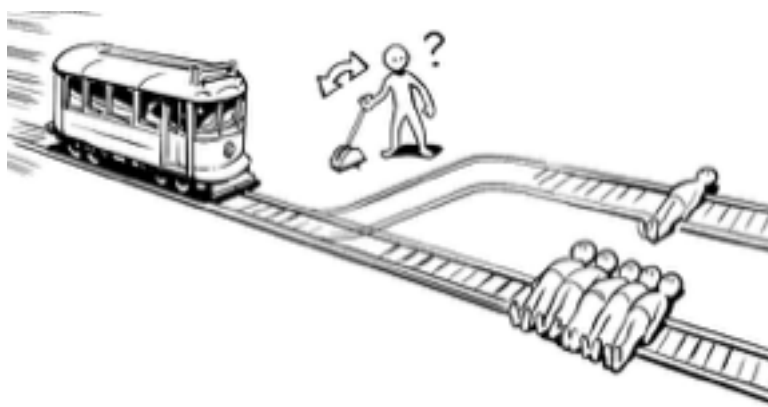
Modified Boat Dilemma

A boat carrying flammable material is out of control. It is heading toward a larger boat with five people on board. You have enough time to change the course of the boat away from the five people. However, the change in course means the dangerous boat will crash into a boat yard where there is one person working. You have two options:

Do nothing and let the dangerous boat hit the large boat with five people (The material will definitely explode and the five people will die).

Divert the boat into the boat yard (The material will definitely explode and the person working there will die).

Artificial Intelligence Models to Support Curriculum Development

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Abstract
This research describes the development of analytical tools to leverage available U.S. Government data to support curriculum development for skills education. Specifically, we apply artificial intelligence neural networks and multiple linear regression models to predict a person's annual wages based on the levels and combinations of skills that they possess. These machine learning models are developed using federal data for 35 general job skills combined with annual wage information for over 960 standard occupations. Given this input data, the resulting neural network trains to above 70 percent accuracy in predicting annual wage levels. The multiple linear regression models provide somewhat lower performance. Curriculum developers and education administrators can use these models to determine what level and mix of occupational skills are most appropriate for meeting student goals and optimizing wage potentials. Job and career seekers can use these models to generate estimates of how well their skills should be compensated by the job market.

Keywords: neural networks, multiple linear regression, occupational skills, salary prediction

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Introduction

This paper describes the results of developing machine learning models that relate over 900 different combinations of up to 35 diverse occupational skills to their overall value (in terms of annual wages) in the job market. The predictive analytics leverage both neural network (NN) and multiple linear regression (MLR) models to provide valuable insights for human resource skills management and concomitant wage determinations.

Machine learning is a subset of artificial intelligence and provides information systems with the ability to learn automatically from example data without human intervention. As computers learn directly from data, the need for humans to specifically program is reduced. This is a substantial benefit because the computer can automatically generate models independent of explicit human programming, which can be time-consuming and costly. This machine learning cost advantage, combined with large amounts of freely available government data (BLS, 2019; ONET, 2019), may provide low-cost tools for curriculum developers and education administrators to determine the most appropriate level and mix of occupational skills for meeting student goals and optimizing wage potentials. Job and career seekers can use these models to generate estimates of how well their skills should be compensated by the job market.

To date, there have only been limited human resource (HR) department moves to apply analytics to discover any inherent insights possibly lurking in large HR data stores. According to Cappelli, Tambe, and Yakubovich. (2019), only 22 percent of firms say they have adopted analytics (machine learning or otherwise) in human resources. And while 71 percent of companies see people analytics as a high priority, progress has been slow (Collins, Fineman, & Tsuchida, 2017).

Some organizations, typically third party online recruiting firms, rather than organizational HR departments, have built models to estimate salaries. Their models are based on very specific inputs such as an individual's location, education, experience, and specific skillset.

As can be seen in Table 1, these models accept very specific skills related to each particular occupation (such as 'Apache Kafka' and multithreading skills for Java programmers), detailed qualifications specific to individuals (such as years of experience). These inputs contrast with our model inputs, which use general skills (see Table 2) that are applicable across almost all standardized occupations. And our models do not require detailed attributes tied to specific individuals. Thus, our models are more likely to be better suited for individuals who may not have significant experience in a field or occupation-specific skillsets and are more interested in how combinations of general occupational skillsets impact salaries.

The third-party salary predictors are typically supported by extensive surveys and large big data collections – which can be expensive and maintenance heavy. Our models leverage free, readily available data already collected by the U.S. government. The data collection and maintenance costs are borne by the U.S. government rather than the company, which may incentivize HR departments to dip their toes into the analytics pond.

The third-party models use their own, much more detailed, lists and definitions of occupations. These occupations differ between the various third party models. The government data, on the other hand, uses a list of standardized occupational job codes that can be easily associated and integrated with the same job codes data across the federal government. This makes analysis across multiple government datasets quicker and easier.

Salary Predictor	Sample Input Data	Reference
Dice	Job Title; Location; Years of Experience; Detailed Skills for Job Title (e.g., Multithreading, Apache Kafka, etc…)	Dice, 2019
PayScale	Job Title; Years in Field; City; Foreign Language; Skills Critical to Job Title; Type of employer; Work Venue	Payscale, 2019
Glassdoor	Current Employer; Employer Location; Job Title; Years of Relevant Experience; Base Salary; Additional Compensation; Highest Level of Education; University; Major/Concentration	Glassdoor, 2019
Salary	Job Title; Location; Education; Years of Experience; Direct Reports; Reports To; Performance	Salary, 2019
Indeed	Job Title; Location	Indeed, 2019
SalaryExpert	Job Title; Location; Highest Level of Education; Major/Field of Study; School Attended; Skills or Specialties; Current Employer Name; Years of Relevant Experience; Current Employer; Years of Experience; Salary	SalaryExpert, 2019
Adzuna	Title, FullDescription, LocationRaw, LocationNormalized, ContractType, ContractTime, Company, Category, SalaryRaw, SalaryNormalised, SourceName,	Adzuna, 2019

Table 1: Salary Predictors

Workforce skills are related to earnings, increased productivity, and economic well-being (Prada & Rucci, 2016). Our models can be used to help both organizations and individuals manage their respective skill inventories by predicting the wages of different skillset combinations. For organizations, wage data can help determine what different skill sets will cost in wages, and budget accordingly.

Individual workers must take responsibility for managing their careers and concern themselves with maintaining their skills to adapt to fast-changing work environments. Hall (1996) describes the protean career, which is driven by the individual rather than the organization. The protean career requires the individual to personally acquire and use an identifiable set of skills. Laar, van Deursen, van Dijka, and Haan (2017) argue that the current workplace requires highly skilled workers who must address increasingly complex and interactive tasks. Employees not only need excellent technical preparation; they also need sufficient skills to adapt to the changing requirements of the job (Carnevale & Smith, 2013). For individuals, our models can provide wage information to help them formulate which skill combinations to pursue.

The NN and MLP models developed with these occupational skills and annual wage training and testing data can be used to provide insights to help management make decisions about how to best manage critical skill needs that are driven by the rapid, and constant, advance of technology. These insights can support the management of pertinent employee skills needed to keep apace and stay relevant, as well as supporting the budgeting of salaries for these skillsets.

Methods

We used the data described in this section to develop, train and test a number of different NN and MLS machine learning models that are also described in this section.

Data Description

Our NN and MLS models use the same independent variables data as inputs to predict the dependent variable, annual wages, as described below.

Independent Variables:

The input data are Skill Level Ratings (which range from 0 to 100) associated with over 900 occupations. In addition to the Skill Level Ratings, the related importance of each skill (Skill Importance Rating) to each occupation is also provided, and also ranges from 0 to 100. For example, a Marketing Manager requires mathematic skills at a Skill Level Rating of 45 out of 100, with a Skill Importance Rating of 44 out of 100. Contrast that occupation with the Refuse and Recyclable Material Collectors occupation which requires a mathematics Skill Level Rating of 7 out of 100, with An Importance Rating of 10 out of 100. Thus, the level of mathematics skills required of Marketing Managers is much higher and significantly more important for them, than for Refuse and Recyclable Material Collectors.

Our analysis looked at different ways of using the occupations Skill Level Ratings and their associated Skill Importance Ratings to assess their impact on performance. That is:

- **Skill Level Ratings Only:** Only the Skill Level Rating data are used as inputs to train the models. The associated Skill Importance Rating data was not used.
- **Skill Level Ratings Only (When Skill Importance > 50):** Occupational Skill Level Ratings were only used if their associated Skill Importance Ratings were greater than 50 (out of 100). The associated Skill Importance Rating data was not used.
- **Skill Level * Skill Importance:** the Skill Level Ratings were multiplied by the Skill Importance Ratings for each occupation.

The Skill Level Ratings data and their related Skill Importance Ratings were provided by the Occupational Information Network (O*NET), which provides this data for 35 different occupational skills that are organized into ten basic skills, one complex problem-solving skill, four resource management skills, six social skills, three systems skills, and eleven technical skills (Table 2).

O*NET is the primary source of U.S. occupational information (ONET, 2019). Their database contains hundreds of standardized and occupation-specific descriptors on hundreds of occupations. The database is developed under the sponsorship of the U.S. Department of Labor (DOL).

Basic Skills • Active Learning • Active Listening • Critical Thinking* • Learning Strategies* • Mathematics* • Monitoring • Reading Comprehension* • Science* • Speaking* • Writing* *Social Skills* • Coordination • Instructing* • Negotiation*	• Persuasion • Service Orientation • Social Perceptiveness *Technical Skills* • Equipment Maintenance • Equipment Selection • Installation • Operation and Control • Operation Monitoring* • Operations Analysis* • Programming* • Quality Control Analysis • Repairing* • Technology Design • Troubleshooting	*Complex Problem-Solving Skills* *Systems Skills* • Judgment & Decision Making* • Systems Analysis* • Systems Evaluation *Resource Management Skills* • Management of Financial Resources* • Management of Material Resources* • Management of Personnel Resources • Time Management*

Table 2: Occupational Skills

The O*NET data is based on several hundred descriptive ratings from O*NET questionnaire responses from sampled workers, occupational experts, and occupation analysts (Fleisher & Tsacoumis, 2012). Randomly sampled workers answer one of several possible 30-minute questionnaires. For occupations where it would be difficult to sample workers, such as those in remote locations, occupation experts are identified and sampled from professional and/or trade association membership lists. The occupation experts complete multiple questionnaires. In addition to the questionnaires completed by workers and occupation experts, additional ratings are provided by occupation analysts. Responses from all three sources (workers, occupation experts, and occupation analysts) are used to provide complete information for each occupation.

Dependent Variable:

The dependent variable output of the models are estimates of the wages for an employee with the different combinations of Skill Level Ratings. The annual wage data used for training and testing the models is provided by the U.S. Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES). The BLS is the principal federal agency responsible for measuring labor market activity, working conditions, and price changes in the economy (BLS, 2019).

The BLS OES provides nationwide, average annual wage data for close to 1000 Occupations in the U.S. across numerous industries and job types. Their dataset includes wage data from high-level positions, such as Chief Executives, to low wage employees, such as fast-food workers. The highest and lowest average annual wages listed in the dataset are $265,990 and $21,230, respectively.

The BLS OES data is gathered from program semi-annual surveys to estimate wages by national, state, and metropolitan areas. We used the 2017 national data. Wages for the BLS OES survey are defined as straight-time, gross pay, which is exclusive of premium pay. The survey covers all full-time and part-time wage and salary workers in nonfarm industries. The wage data includes base rate, cost-of-living allowances, guaranteed pay, hazardous duty pay, incentive pay, on-call pay, and tips. The wage data does not include back pay, jury duty pay, overtime pay, severance pay, shift differentials, nonproduction bonuses, tuition reimbursements, or data from self-employed workers. The BLS OES surveys approximately 180,000 to 200,000 establishments every six months - so it takes three years to completely collect the full sample of 1.2 million establishments (BLS, 2019).

The BLS occupational annual wage data was integrated with the O*NET occupational skills data via job codes to create a consolidated dataset that links the 35 skillsets to the wage data for 967 occupations. The initial dataset was then pruned to 937 occupations to eliminate missing and incomplete data.

Model Development

We used the open-source RStudio integrated development environment (https://www.rstudio.com), along with the R programming language to build several NN and MLR models from the occupational data. There are over 25 different NN architectures available to choose (Mehta, 2019). We selected the backpropagation NN architecture because it is a widely used, classical architecture that is suitable for the type of analysis we are performing. The model development steps are summarized below.

1. Integrate 35 occupational skills data (independent variables) with associated national wage data (dependent variable)
2. Run correlations against all the independent and dependent variables.
3. Run MLR using the 35 occupational skills and their annual wages.
   o Use a variety of combinations of Skill Level Ratings and Skill Importance Ratings for the analysis.
4. Build, train, test, and run backpropagation NNs (using 35 occupational skills and their wages)
   o The NN structure hyperparameters consisted of 35 input nodes, with a 3 node hidden layer, another single node hidden layer, and a single output node. Two hidden layers were chosen because a two hidden layer architecture can approximate any smooth mapping to any accuracy (Heaton, 2017). Training time was not a significant issue given the reasonable size of our dataset. A number of models were tried using different structure hyperparameters. The architecture with a 3 node hidden layer and another single node hidden layer provided

performance similar to more complex NNs with larger numbers of nodes in the hidden layers.
   o The default logistic activation function is used in the nodes.
5. Run stepwise forward and stepwise backward MLR algorithms to select the skills with the highest prediction power. This step reduced the number of inputs from 35 to 19.
6. Run MLR using the reduced number of inputs (using 19 occupational skills and wage data).
7. Build, train, test, and run backpropagation NNs against reduced inputs (using 19 occupational skills and wage data).
   o The NN consists of 19 input nodes, with a 3 node hidden layer, another single node hidden layer, and a single output node. The reasons these hyperparameters were selected are the same as those explained in Step 4.
   o The default logistic activation function is used in the nodes.
8. Perform cross-validation for the NN and MLR models.
   o Train on 90% of randomly selected records and test on the remaining 10% of records.
   o Calculate the accuracy, where accuracy is determined by:
     1 - MEAN(ABS(Actual Wages - Predicted Wages)/Actual Wages))
   o Repeat ten times with randomly selected training and testing records.
   o Calculate the average accuracy over the 10 experiments.

Results

The correlation matrix showed that the correlation coefficients between the independent variables and the dependent variable (wages) ranged from -0.26 to 0.73.

MLR and both stepwise forward and backward linear regression techniques were employed to improve the prediction power of the inputs. This reduced the number of independent variables from 35 to the 19 that are marked with asterisks (*) in Table 1.

The results of running the models are provided in Table 3, which provides the accuracy for the NN and MLR models, along with the R-Squared values for the MLR. In each case, these are averages of running the models ten times with random training/testing using 90/10 data splits. These values are provided for inputs of the full complement of 35 Skill Ratings, as well as the reduced set of 19 Skill Ratings.

35 Skills			19 Skills		
	NN	MLR		NN	MLR
	Accuracy	Accuracy R^2		Accuracy	Accuracy R^2
Skill Level * Skill Import	0.764	0.761 0.647	Skill Level * Skill Import	0.786	0.761 0.647
Skill Level Only	0.761	0.715 0.62	Skill Level Only	0.705	0.715 0.62
Skill Level Only (Importance > 50)	0.710	0.671 0.409	Skill Level Only (Importance > 50)	0.728	0.671 0.409

Table 3: Results

Figure 1 visually compares the predicted wage values against the actual wage data for the models trained against the subset of 19 skill rating variables. A perfect fit between actual and predicted salaries would show the dots falling perfectly on the line for a mean square error (MSE) of zero. Figure 2 provides the same visual information for the regression predictions.
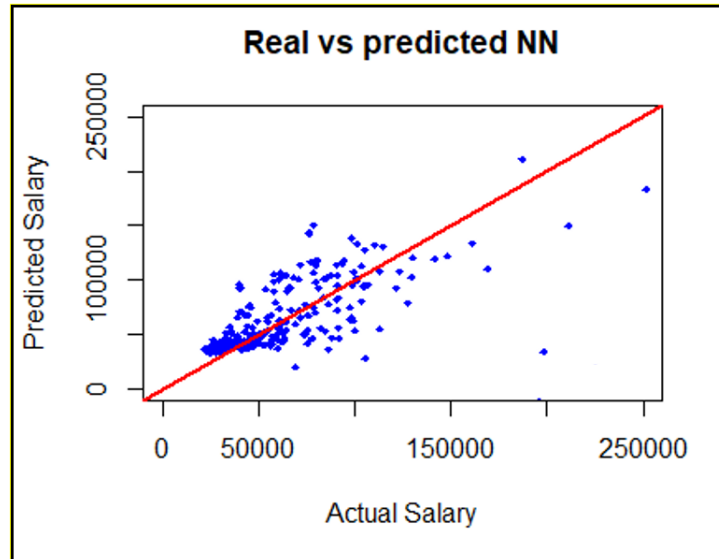
Figure 1: NN Predicted vs. Actual
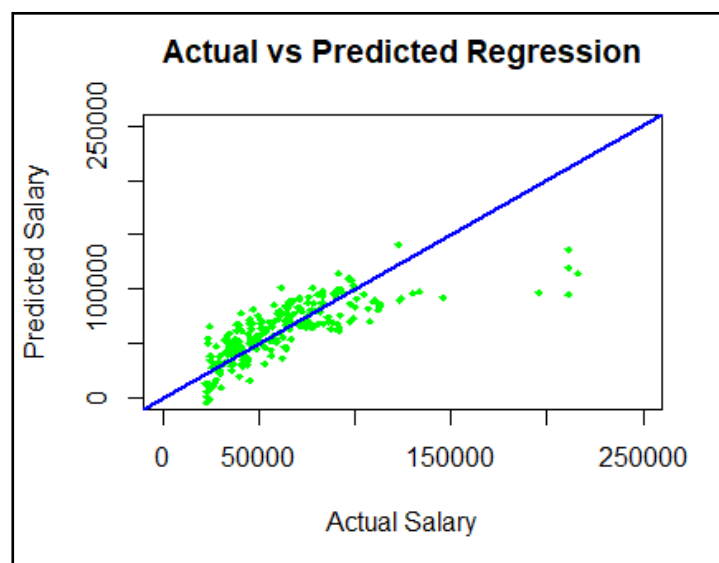
Figure 2: MLR Predicted vs. Actual

Conclusions

We have created initial models that use freely available standardized skills and wage data that can be used by organizations and individuals to determine the wage values of different combinations of general skillsets. Since the data is collected and maintained by the Federal government, this may provide a relatively low-cost way for HR departments to initiate HR analytics. These models may prove useful for the analysis of wages based on general skillsets (see Table 2), that apply across nearly all

occupations rather than the types of very specific occupation-related skills listed in Table 1. These more general models may be better suited for individuals, such as students, who do not have significant work experience or occupation-specific skillsets.

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A Review of Foreign Language Policy Research Literature in China through Bibliometric Analysis of CSSCI: History, Content and Trend

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Abstract

This research investigates the structure and dynamics of foreign language policy and planning research in China over the last twenty years by using CiteSpace, a well-established software for bibliometric analysis. The purpose is to aid researchers and policy makers overseas and domestic to attain a clear picture of current state of this field. 203 articles were extracted in China Social Science Citation Index (CSSCI) published between January 1998 and December 2018 with the key words "foreign language policy" or foreign language planning", or "foreign language policy and planning" for topic search. The results show that foreign language policy study in China sprouted around 1999, underwent three stages. By keyword co-occurrence analysis, the main topics changed from foreign language education, foreign language teaching &learning, language policy, education policy, pluralism, globalization, foreign language education policy, language planning, national foreign language capacity, language strategy, language resources, the USA, national interest, to global competence. Those topics fall into two clusters; however, the two clusters converge into the same label as national language capacity development. Reference co-citation analysis shows co-cited references form five clusters with national language capacity development as the largest and latest one. Comparison of the total network and the main network shows the research content is quite concentrated. A continued trend toward national language capacity development and global competence is predicted.

Keywords: review, foreign language policy, bibliometric analysis, CiteSpace

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Introduction

Foreign language policies in China are regarded as an integral part of national development planning. In the recent years, research in foreign language policy and planning has gradually become a prominent topic. Though a few literature reviews have been conducted so far, no bibliometric analysis based on well-established informetric software has been utilized to investigate this field.

The research purpose is to investigate the structure and dynamics of foreign language policy and planning research in China over the last twenty years using CiteSpace, a well-established informetric software with the hope of creating an overview of historical content trends in this field from existing foreign language policy research literature in CSSCI (Chinese Social Sciences Citation Index), and providing assistance to researchers and policy makers to attain a clear picture of current state of this field.

China has the largest population in the world and the largest population of foreign language learners. Therefore, insights into the evolution of research in this domain will contribute to academic research and policy decision making both overseas and domestically.

Foreign language in this paper refers to all languages except Chinese and different dialects of Chinese. Language policy as defined here includes language planning, language policy, and language policy and planning, which are not distinguished in consideration of the multi-disciplinary and inter-disciplinary nature of language policy domain.

Methodology

Source of data

The data *for* this article *was* retrieved from CSSCI. CSSCI (Chinese Social Sciences Citation Index) is a citation index with abstracting and indexing for more than 500 academic journals covering 25 disciplines among over 2700 academic journals of social science. The CSSCI series database has been ordered or used by hundreds of universities and research institutes such as Peking University, Tsinghua University, Renmin University of China, Fudan University, National Library, and Chinese Academy of Sciences. Most Chinese universities and institutes use CSSCI as a basis for the evaluation of academic achievements and promotion.

Selection criteria

The data were collected from the articles related to foreign language policies in China Social Science Citation Index (CSSCI) published between January 1998 and December 2018. The following key words "foreign language policy" or foreign language planning", or "foreign language policy and planning" were used for topic search first in CNKI, another well acknowledged database in China due to more richness of data and retrieval approaches. 257 articles were retrieved; after manually input into CSSCI, 203 articles were selected. The non-academic articles such as calls

for papers, conference information and academic articles whose primary concern was not foreign languages were excluded.

Research Methods

The main method used is bibliometrics, an application of quantitative analysis and statistics to publications, which becomes one of the main ways used globally in research performance evaluation by policymakers, research directors and administrators, information specialists and librarians, and researchers themselves.

The tool used was CiteSpace, which is a well-established and freely available Java application of informetric analysis for visualizing and analyzing trends, patterns and networks in scientific literature. It generates interactive visualizations of structural and temporal patterns and trends of a scientific field and facilitates a systematic review of a knowledge domain through an in-depth visual analytic process (Chen, 2004, 2006, 2010). It is widely used among researchers from a variety of disciplines and countries.

This research chose CiteSpace as the tool for bibliometric analysis instead of other software because it can process citation data from popular sources such as Web of Science, Scopus, and Chinese Social Sciences Citation Index (CSSCI) and CNKI, the latter two being the most important database in China. In addition, CiteSpace, as compared to other bibliometric software, is user friendly, featured with powerful visualization and suitable for citation analysis.

Before the dataset was put in, keywords translation was done for the 14 papers which did not have English keywords by google translate and having been verified according to the content of the articles.

The functions used were timeline view, citation burst, keywords co-occurrence analysis, clustering and evolution of keywords, citation analysis and network visualization such as reference co-citation, cluster of cited reference to investigate the structure and dynamics of foreign language policy research domain.

Based on quantitative analysis and visualization, qualitative method is employed to analyze and describe the history, and content in this domain and clarify the trend of future studies.

Results and Discussion

Distribution Characteristics over Time
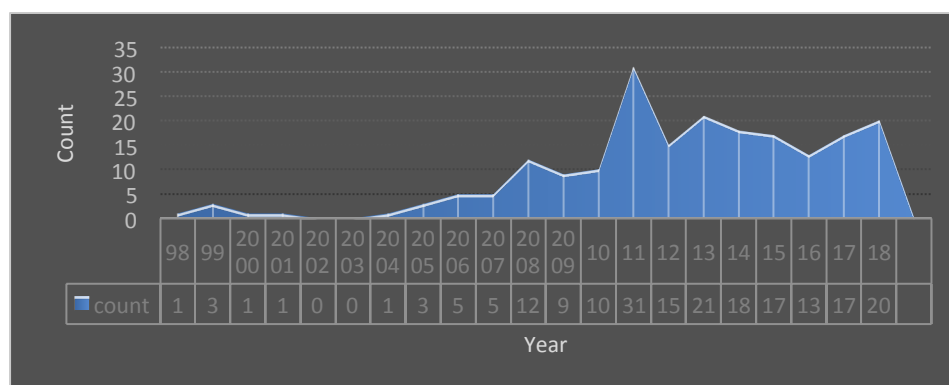
Figure 1. Annual Distribution Curve of Papers on Foreign Language Policy between
Jan. 1998 to Dec. 2018

The distribution of papers over time is an important indicator to evaluate research
development in a domain. From Figure 1, we can easily see the rise of foreign
language policy research started from 2008 and remained rising till 2018 with the
peak in 2011. According to the statistics, three phases constituted the 20 years of
development in foreign language policy research: initial phase (1998-2005), medial
stage (2006-2007) and contemporary stage (2008-present). Research in the first stage
was mostly concerned with foreign language education, which related to foreign
language policy but was the focus of study. Xu (1999) introduced economics of
language to this field and Hu (2001) pointed out the balance between the current
political and economic interest and long-run demand of education by reflecting on
gains and loss of foreign language planning and practice in the past 50 years. The
second phase witnessed foreign language policy as research focus, (eg. KE Fei &FU
Rong 2006, LU Ziwen 2006, ZHANG Yi, 2007, JIA Aiwu, 2007）mainly
introducing language policy overseas, especially the US from the strategic perspective
of national security. Hot stage started from 2008 and lasted till now. The research
topics and timeline will be shown in the following figures and tables.

Keyword Co-occurrence Network

Keyword in keyword co-occurrence refers to the noun phrases that appear in the title,
and keywords of a paper. The rationale of keyword co-occurrence analysis is to
identify the interconnection of topics in a literature dataset by paired presence of noun
phrases (Chen, 2006).

The thick colored line at the top of Fig. 2 is the timespan from 1998 to 2018 (Slice
Length=1). From the left to the right, colors shift from cold to warm, with the darkest
color corresponding to the earliest dates. Every node in the figure indicates keywords
in titles and keywords of papers. The larger the node is, the more frequent the
keyword occurs. The line between the nodes indicates the co-occurrence of two
keywords. The thicker the line is, the more frequent the two keywords present in pairs.
The colors of the lines indicate the time just as the above colored timespan.

As shown in Fig 2, there are two groups of keywords, a major one and a minor one. In the major group, the keywords with centrality≥0.10 are foreign language education (0.31), the USA (0.23), education policy (0.21), national foreign language capacity (0.14); in the minor cluster, there are no keywords with centrality ≥0.10. But the latest research topics are shown in the minor cluster as "China", "One belt, one road", "language education policy" and "linguistic economics", in the major cluster is "the USA", "language planning", "language policy" and "foreign language education".
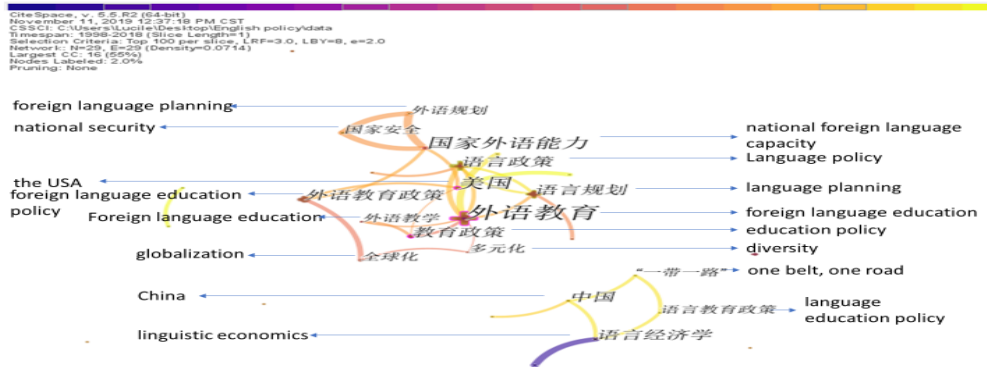
Figure 2. Keyword Co-Occurrence Network

Keyword Clustering Timeline
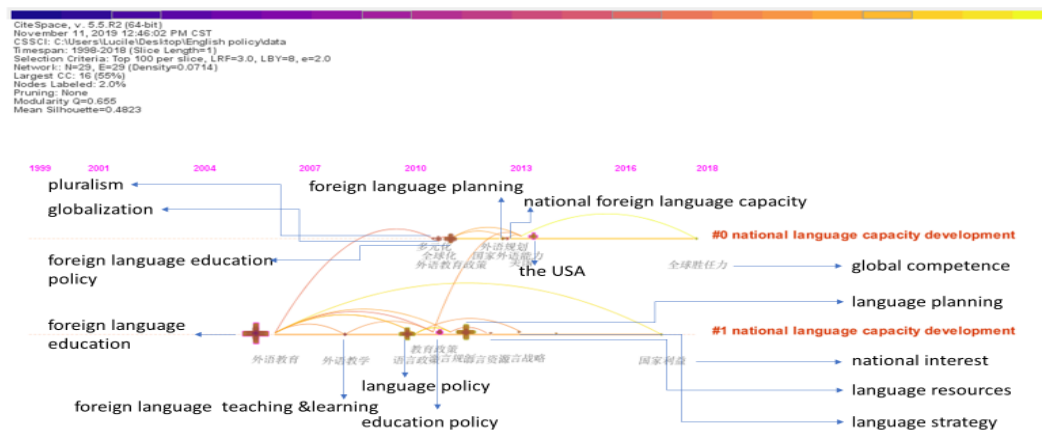
Figure 3. A timeline view of keyword clustering

A timeline visualization (Figure 3) provides an intuitive overview of the development of a field. The largest keyword cluster represented by #0 is national language capacity development. Following the timeline, we can see after 2010, researchers started to focus on pluralism, globalization and foreign language education policy; around 2013, foreign language planning, national foreign language capacity and the USA became topics of research; in 2018, global competence became the most frequently keyword. The second largest cluster represented by #1 is also national language capacity development. In this timeline, the largest node was foreign language education around 2005; the intensive group of nodes started from 2010 and proceeded to 2014 as language policy, education policy, language planning, language resources, language strategy. In 2017, national interest became the node.

From Figure 3, we can see the latest topics are global competence and national interest with both the clusters labelled as national language capacity development.

Timeline of Reference Co-citation
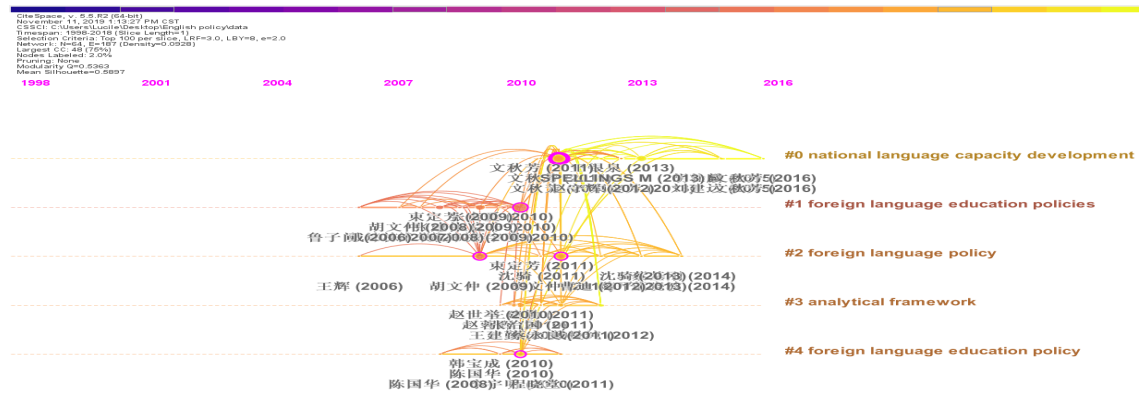
Figure 4. A timeline view of reference co-citation

Fig 4 shows the 5 clusters labelled as #0 to #4 in descending order of the number of papers in each cluster. The papers within a cluster show the closer co-citation relationship each other.　The color indicates the time. The largest cluster is also the latest labelled as national language capacity development; the other four ranking in chronical order is #2, #3, #4, #1.

References Co-citation Network

Figure 5. Main Network of Reference Co-citation	Figure 6. Total Network of Reference Co-citation
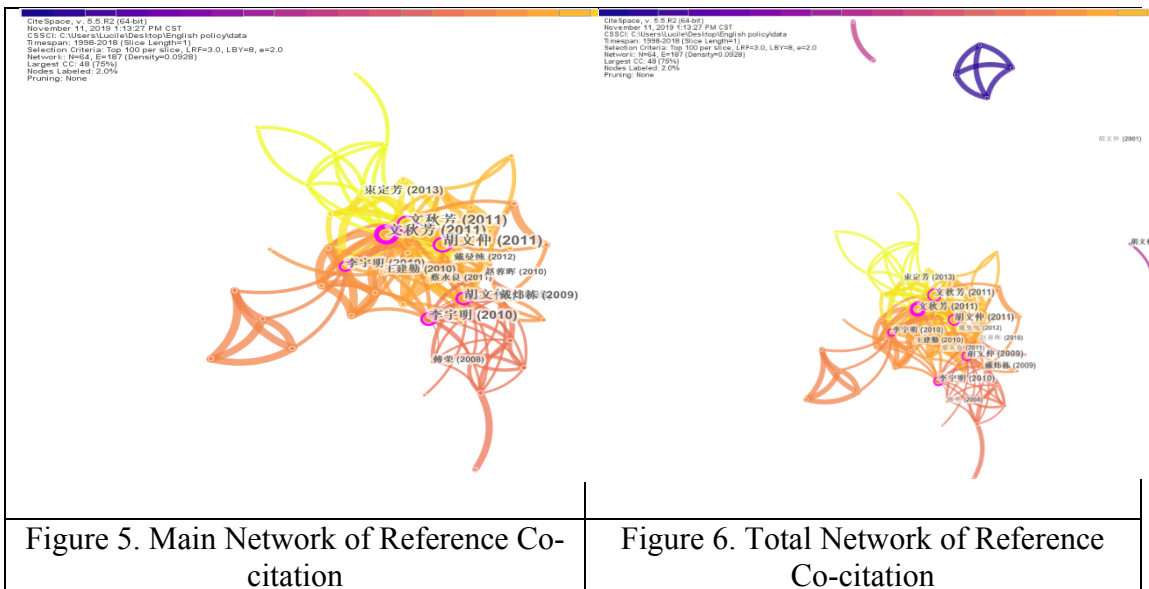
By comparing Fig. 5 and Fig. 6, we can see the research content of this field quite concentrates as Figure 3 shows.

Citation Burstiness

Top 2 References with the Strongest Citation Bursts

References	Year	Strength	Begin	End	1998 - 2018
胡文仲, 2001, 外语教学与研究, V0, P0	2001	3.22	**2006**	2008	
束定芳, 2013, 外语教学与研究, V0, P3	2013	3.6998	**2016**	2018	

Figure. 7 Top 2 References with the Strongest Citation Bursts

Citation burstiness indicates the paper is cited by an increased number of papers in a given period, which suggests research hotspots in that period. Two papers are the strongest citation bursts, the first of began from 2006 and ended in 2008; the other began from 2016 and continued till 2018. Hu (2001) pointed out the balance between the current political and economic interest and long-run demand of education by reflecting on gains and loss of foreign language planning and practice in the past 50 years. Shu (2013) addressed the issue of foreign language education planning and distribution in China. She states that foreign language talents are of important resources. The government should plan and distribute foreign language education based on reality as well as with a far vision.

From the above description, we can see that foreign language policy study in China sprouted around 1999, underwent three stages. According to keyword co-occurrence analysis, the main topics in this field changed from foreign language education, foreign language teaching &learning, language policy, education policy, pluralism, globalization, foreign language education policy, language planning, national foreign language capacity, language strategy, language resources, the USA, national interest, and global competence. Those topics fall into two clusters; however, the two clusters converge into the same label as national language capacity development. Reference co-citation analysis shows co-cited references form five groupings, chronologically, foreign language education policies, foreign language education policy, analytical framework, foreign language policy, national language capacity development which makes the largest and latest cluster of co-cited references. In addition, by comparing the total network with the main network, we can see the research content in this field is quite concentrated which indicates lack of diversity. Finally, the predictable trend in this field in line with the above analysis will be national language capacity development and global competence.

Conclusion

The findings indicate research content in foreign language policy in China converges on national foreign language capacity and global competence, which suggests the nature of language policy that researchers in this domain interpret as "The exercise of language planning leads to, or is directed by, the promulgation of a language policy by government (or other authoritative body or person)" (Kaplan and Baldauf 1997: xi). However, there are other scholars who argue "Language policies do not need to be enacted by an authoritative body – they can emerge from a bottom-up movement or grassroots organization – and not all language policies are intentional or carefully planned" like Harold F. Schinffman, Spolsky, McCartyet (Johnson 2013: 1). Therefore, the future in this domain expects diversity.

The limitations of this research lie in two aspects. One is the small dataset of 203 papers; the other is the references cited by the 203 articles not included. But the limitations are also the merits in that the results of this research demonstrates more explicitly the main studies accomplished by those prestigious researchers of this field.

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Matriarchs Matter:
Family Influences to Scientific Thinking of Women of Color in the Community College

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Abstract

In the University of California system, community college transfer students comprise of 48% of graduates with STEM bachelor's degrees. This demonstrates that two-year colleges help pave the career pathways of community college students, many of which are students from underrepresented backgrounds in STEM fields. To cultivate the potential of women of color in pursuing STEM fields in the community college, focusing on their standpoint will empower them in centering their own perspectives in their own retention and success. Learning more about their standpoint also highlights their knowledge production as future producers of knowledge in the STEM fields. To obtain the influences to their scientific thinking development, 35 women of color STEM majors answered a social network questionnaire by nominating these influences. Social network analysis was used to analyze their influential social networks. Results demonstrate that family members have the highest frequency of influence to scientific thinking, regardless of educational attainment at the high school or lower levels. These relatives also heavily consist of matriarchal figures, such as mothers and grandmothers, especially as influences to scientific observation and scientific justification. These findings signify the importance of family in cultivating intellect, whether or not the relatives obtained college degrees or higher. Significance also supports emphasis on the students' standpoint in self-determining their own success, and creates a campus culture that celebrates family-inclusiveness. Creating campus programming that caters to students' strong relationships with their families may promote even more persistence in their STEM career trajectories.

Keywords: community college, STEM, feminist standpoint theory, social network analysis, mixed methods, women of color STEM, Hispanic-Serving Institutions, first generation students

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Introduction

With an approximately 60% White male majority (Oh & Lewis, 2011), United States federal agencies such as the National Science Foundation and National Institutes of Health acknowledge the urgency of expanding efforts to broaden participation of underrepresented groups, such as women of color, in STEM fields (Valentine & Collins, 2015). Deficit perspectives such as inadequate preparation and training in navigating academia (Koenig, 2009) have been blamed for the underrepresentation of women of color in this field. However, women of color enter STEM majors in college "just as likely as their White peers" but face institutional obstacles and need to negotiate these complex environments that may not be very welcoming for women of color (Ong et al., 2011). This underrepresented group face "double bind" issues from their minoritized social status as both women and non-White in a field dominated by White males (Malcolm et al., 1976).

The magnification of women of color STEM majors' standpoint as they navigate community college invokes the framework of feminist standpoint theory, which recognizes the power of the oppressed and their potential in using their knowledge as a liberatory practice for dismantling patriarchy (Harding, 2004). An asset-based framework, this theory upholds the marginalized location of this underrepresented group in this field as an epistemological advantage of having the function in the world in which their position is located in a marginal location and also the specialized knowledge of their specific social location which has its own nuanced ways of knowing and seeing the world (Collins, 1989; Sandoval, 2004).

With the potential consequences of an individual's marginalized social location (Newman, 2010; Otte & Rousseau, 2002), employing social network analysis provide a potential avenue of analyzing the effects of standpoint on how women of color develop and eventually produce knowledge in the STEM fields. In the context of studying women of color STEM majors in the community college, social network analysis is a methodological tool in exploring how the concept of marginal location may influence an individual's standpoint, and hence, knowledge production. The implication of this may elucidate possible mechanisms of how broadening participation to members of underrepresented groups in the STEM fields can enrich the diversity of ideas and perspectives in the disciplines from their unique standpoint.

Potential influences to the scientific development of women of color STEM majors may range, depending on their social location and access to knowledge. Even as far back as middle school, parents with technical backgrounds have been shown to support creative technological activities of their children (Barron et al., 2009). In college, if they engage in research activities, students' faculty advisors have been shown to transfer research views to their mentees (Leahey, 2006). On the other hand, Espinosa (2011) found that frequency of interactions with peers—not necessarily professors—greatly impact retention of women of color in their STEM majors; the author also recommended women of color attend a private college and/or an institution "with a robust community of STEM students." However, a very limited number of women of color could afford to matriculate into private institutions.

Yet, there is great potential in reaching women of color STEM majors in community colleges and Minority-Serving Institutions (MSIs). In the University of California

system, community college transfer students comprise of 48% of graduates with STEM bachelor's degrees (Community College League of California, 2015). One-fourth of all Chicanx doctorate degree holders were also transfer students (Community College League of California, 2015). This demonstrates that two-year colleges help pave the career pathways of community college students, many of which are students from underrepresented backgrounds in STEM fields. To cultivate the potential of women of color in pursuing STEM fields in the community college, focusing on their standpoint will empower them in centering their own perspectives in their own retention and success. Learning more about their standpoint also highlights their knowledge production as future producers of knowledge in the STEM fields.

This study asks the following research questions:
  (1) Who influences the scientific thinking of women of color STEM majors in the community college?
  (2) How do nominees influence the scientific thinking of the participants?

Methods

Study site: The site is a two-year college that is designated as a Hispanic-Serving Institution (HSI) in an urban metropolitan area in Southern California. Student population in 2018 was approximately 20,000 students—of which at least 75% are students of color. Almost 60% of the student body were women. More than half of total school population identify as Latinx. Finally, approximately 45% of the campus study body was first generation college students; approximately 60% received financial aid.

Participants: Between January 2017-March 2018, 35 women of color STEM majors were recruited via snowball sampling, flyer distribution, and in-person recruitment. Eligibility for the study required affirmative responses to the following questions:
  (1) Are you currently a student at the site?
  (2) Are you majoring in STEM (Science, Technology, Engineering, and Mathematics)?
  (3) Do you identify as a woman of color, e.g., Latina, African American, Native American, Asian Pacific Islander, or multicultural?

Participants consisted of these STEM majors: 42.86% Biology, 22.86% Chemistry/Biochemistry, 17.14% Engineering, 5.71% Physics/Astronomy, 8.57% Nutritional Sciences, and 2.86% Computer Science. The following races were also represented by this sample: 51.43% Latina, 17.14% Black/African American, 17.14% Asian Pacific Islander, and 14.28% Multicultural.

Social network questionnaire: A convergent mixed methods approach was employed via a social network questionnaire to obtain the influences to the participants' scientific thinking development. The questionnaire consisted of a name generator to specific aspects of scientific thinking—particularly, who has influenced (1) scientific observation, (2) scientific explanation, (3) scientific critique, (4) scientific justification, and (5) legitimization of scientific knowledge. The demographic characteristics of each nominated influence were obtained at the end of the name generation. Concurrently, participants were given the option to share any narratives

about their nominations, although this was not required. 100% of the participants offered qualitative insights regarding their influences.

Data analysis: Ego-centered social network analysis was used to analyze participants' influential social networks (Newman, 2003). Nominations were quantified by each aspect of scientific thinking and also in total. Nominee data were assigned categorical relationships according to their relationship to the participant according to the following shortcuts:
cc = College faculty and staff
fam = Family members
fri = Friends met outside the college
k12 = K-12 educators and school staff
loc = Local community members who are neither relatives nor friends outside the college
pf = Public figures such as Albert Einstein or popular media characters
rel = Religious figures
sm = Schoolmates or friends on-campus

Nominations were also disaggregated according to their demographic information, such as race, gender. Available narratives about nominations were then triangulated with the quantitative findings about the networks. The software Tableau was used to create data visualizations.

Results

Social network questionnaire: 450 nominees were named as influences to all participants. The nominations demonstrate diverse social networks of influences to the scientific development of the sample group. Figure 1 shows all of the categorical relationships represented by the nominations on the combined aspects of scientific thinking: 33.33% Family, 22.44% College faculty and staff, 11.78% Public figures, 11.33% K-12 educators and school staff, 6.89% Schoolmates or friends on-campus, 6.67% Friends outside the college, 4.89% Religious figures, and 2.67% Local community members.

Among all categorical relationships, family members have the highest frequency of influence to scientific thinking, regardless of educational attainment at the high school or lower levels. When network data was disaggregated by categorical relationship and race/ethnicity, Latinx family members had the highest number of nominations with 15.11%. Meanwhile, when network data was disaggregated by categorical relationship and gender, women relatives obtained the highest number of nominations in the following aspects of scientific thinking: scientific observation and scientific justification with 18.29% and 22.39% in each scientific thinking category, respectively.
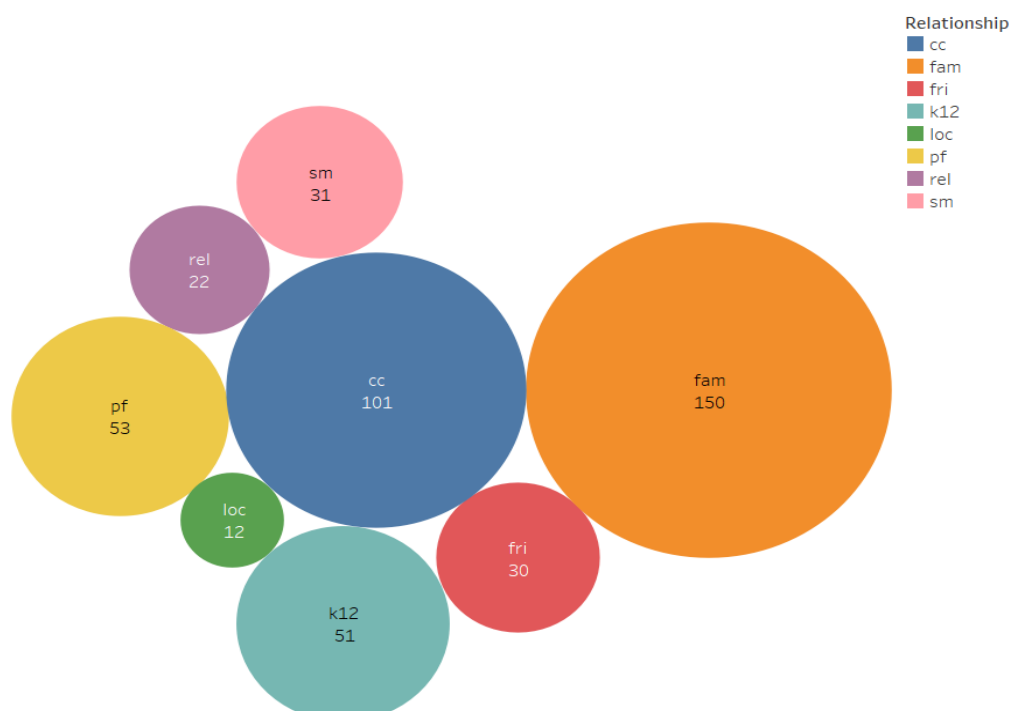
Figure 1. Total Number of Nominations To the Influence to Scientific Thinking of Participants By Categorical Relationships. Results show diversity of influences with family (fam) having the highest number of nominations at 33.33% of all nominations.

Hence, a substantial portion of the influences are women relatives (as well as Latinas, possibly due to more than half of the participants also being Latina-identified). These relatives also heavily consist of matriarchal figures, such as mothers and grandmothers, especially as influences to scientific observation and scientific justification. Scientific observation refers to the act of making observations, while scientific justification alludes to the act of justifying knowledge or taking a position and asserting it.

Qualitative narratives

Although optional, all participants shared stories that elucidate their rationale behind nominating their influences concurrently during the social network questionnaire. Based on the quantitative results of high frequency of women relatives, qualitative data was triangulated with these findings. Henceforth, this paper now narrows its focus on the impact of women relatives on the scientific justification development of the participants.

In alignment with the highest frequency of nominations for scientific justification, qualitative narratives demonstrate that assertive and analytical matriarchs impacted this aspect of women of color's scientific development. The matriarchs that have been nominated include mothers, grandmothers, aunts, and older sisters. The stories about these matriarchs share common characteristics of being strong and empowering family figures who have been shaping the participants' minds even before they entered college, even though the relatives may not have finished high school or college.

An example of these matriarchal influence stories is from a 28-year-old Latina Biochemistry major named Gwen who nominated her mother—the family figure who has raised her to always "have to defend [her] own." When Gwen was in high school, she was very shy—struggled to vocalize her opinions; she recalled having a teacher who bullied her—told Gwen that she was wrong even though she knew that she was correct since she did a class project on her own. Gwen's mother then encouraged her to "defend her own"—to voice out her ideas in class and not let the teacher discredit her own opinions. Gwen's mother taught her daughter how to be fearless in asserting her ideas and position even to the high school teacher, a figure of authority. Since then, Gwen has translated this familial lesson into the realm of the classroom in which she can now confidently justify her own ideas and assert them.

Another matriarch who has influenced one of the participants is the older sister of 24-year-old Latina Molecular Biology major, Elsa. Elsa credits the development of her scientific justification to her sister who "always argues with [her]" and "has a strong opinion on things." Elsa's opinionated sister--who sounds like a devil's advocate—may have inadvertently sharpened Elsa's critical thinking throughout their lives growing up side-by-side. Seemingly contentious debates between sisters actually impressed the younger sibling--whetting the mind for disputing ideas and taking positions on some. Elsa applied these same critical thinking skills in asserting her own ideas in the classroom.

Convergent findings

Data triangulation of the qualitative stories of matriarchal influence on the critical thinking of participants with the quantitative findings of high frequency of nominations for women relatives highlights the impact of family—community wealth capital—on the scientific thinking development of women of color STEM majors in the community college. Regardless of the educational attainment (oftentimes high school or lower educational level), relatives still made an impression in the minds of the participants throughout their lives—and the participants transferred these critical thinking skills in how they think about and do science in the classroom.

Conclusion

These findings signify the importance of family in cultivating intellect, whether or not the relatives obtained college degrees or higher. Matriarchs in the family also impact the scientific observation and scientific justification development of women of color STEM majors in the community college.

The findings on the significance of family on the intellectual growth of participants align with the importance of community wealth capital. Situating it in the academic realm of feminist standpoint theory, this study magnifies the standpoint of an understudied group in the literature: women of color STEM majors in the community college. This study also contributes to critical social network analysis—focusing on everyday lived experience of the participants instead of relying merely on indicators to predict influence.

Significance also supports emphasis on the students' standpoint in self-determining their own success, as well as inspiring the creation of a campus culture that celebrates

family-inclusiveness. Creating campus programming that caters to students' strong relationships with their families may promote even more persistence in their STEM career trajectories. Implications of this study also include focusing on the standpoint of the actual participants—women of color STEM majors in the community college—as primary stakeholders and central self-agents in their own academic success and STEM field retention.

Acknowledgements

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No-Level Brick Japanese Language Education: Understanding Learning as Participation in Practice through a Communities of Practice Perspective

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Abstract

This study explores one of the aspects—facilitators—of a unique undergraduate Japanese as a foreign language course at an Italian university. Facilitators who are neither teachers nor students have received limited attention to date in the field of foreign language education. This study aims to contribute to scholarly knowledge by providing insight into the experience of peer-facilitators. Communities of practice and situated learning facilitate the context-sensitive exploration of the facilitator learning experience with particular attention to participation and identity. In the course employing dialogic pedagogy, the facilitators assisted dialogic teaching and learning while reflecting upon their facilitation in the facilitator group. They had frequent face-to-face and online interactions and submitted weekly reflection report over a fifteen-week academic semester in 2019—these are the primary data sets of this study. Using thematic analysis, this qualitative case study attempted to reveal the change that the facilitator group underwent and the change which one of the facilitators underwent in the course comprehensively. This study found that the facilitator group shifted its focus from listening to and following the course teacher instructions to discussing their facilitation for the students. The focal facilitator changed his way of participation and identity when his image of a facilitator came to be not an authoritative figure who instructs what the students should do but the supporter who walks along with the students. Drawing on the findings, this study suggests designing a holistic learning environment and reconsidering the attitude to learning outcomes to enrich participatory learning.

Keywords: Facilitator, Communities of Practice, Situated Learning, Participation and Identity, Japanese Language Education

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Introduction

This study explores one of the aspects of a unique undergraduate Japanese as a foreign language (FL) course at an Italian university. The focus of this study is placed on experiences of facilitators who are neither teachers nor students in the course. The facilitators were either voluntarily participating undergraduate students, postgraduate students or part-time language teachers of the university. In the course which employed a dialogue approach for Japanese language teaching and learning (e.g. Hosokawa, 2019, Hosokawa, Otsuji & Mariotti, 2016), the facilitators assisted dialogic teaching and learning. Facilitator assistance was enhanced by forming a discussion group and engaging with dialogue about their facilitation regularly face-to-face and online outside the class time. To date, no matter which educational approach is concerned, teachers and/or students are at the center of attention in language education research. Now, the term—facilitator is often used to replace the traditional image of teachers as an authoritative figure with teachers as a less authoritative figure (O'Dwyer, 2006). Therefore, facilitators as not teachers but peers are relatively less touched upon even when previous studies mention them e.g. near-peer role model (Murphy, 1998). Thus, the limited number of studies has explored the experiences of peer-facilitators in the field of FL education. Conducting more studies about such members in FL classrooms can be fruitful for future FL educational design.

This study aims to contribute to scholarly knowledge by providing insight into the experience of peer-facilitators in the above-mentioned course. The experience is explored drawing on Communities of Practice (CoP; Wenger et al., 2002) and its associated concept, Situated Learning (SL; Lave & Wenger, 1991). These allow this study to understand how the facilitators shape the context of their learning and the context shapes their learning—these are mutually constitutive. The data of this study are qualitative—online discussions and weekly reports collected over a fifteen-week academic semester in 2019. Thematic analysis (Nowell et al., 2017) of the data set reveals the change that the facilitator group underwent and the change which one of the facilitators underwent in the course. Drawing on the findings, this study concludes by discussing the importance to design ones' learning as participation in distinct but interconnected communities. It further suggests that a longer-term and process-oriented view is called for to understand the learning through participation in social practice.

Literature Review

This section first provides a theoretical view—CoP (Wenger et al, 2002) and its associated concept SL (Lave & Wenger, 1991), which shapes the understanding of learning in this study. It is important to note that the underlying assumption of CoP and SL contrasts to the so-called acquisitional view of learning—learning as individual practice for cognitive development (Sfard, 1998). Then, the studies informed by the CoP and SL are reviewed to discuss the need for this study.

Theoretical View: Situated Learning and Communities of Practice

The fundamental view of learning in this study is informed by SL. SL is theorized based on the observation of learning in apprenticeship communities e.g. tailors or midwives. For the scholars drawing on this view, learning is not individual but

fundamentally social practice unlike the understanding of scholars drawing on an acquisitional view of learning (Sfard, 1998). They understand that learning occurs when individuals change their ways of participation and accordingly their identity while participating in a context where essential knowledge and skills are embedded. In this participation and identity change, learning and doing are inseparable. Such a learning process is associated with a move from newcomers to competent, contributing and responsible participants of a particular group of people (Lave & Wenger, 1991). The outcomes of such learning coincide with building an effective community which strives to achieve a shared purpose. The quality of this type of learning is enhanced when a community is built and sustained as CoP.

CoP is defined as "a group of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger-Trayner & Wenger-Trayner 2015, p. 1). CoP is composed of three fundamental elements. *Domain*—a shared concern or passion—drives what the group strives to achieve. *Community* is where they feel a sense of trust, respect and belongings. Regular interaction facilitates relationship and community building. *Practice* is a set of shared ways of doing things that members keep negotiating, developing, and sustaining. They learn how to do what they want to do better by taking part in the practice. When three components orchestrate, a group of people are considered as CoP.

When a group functions as CoP, the participation of its members is encouraged and then their participatory learning is enriched. This theory has impacted how to view learning and how to design learning environment in companies (e.g. Ishiyama, 2018), online platforms (Schlager et al., 2002, Herrington et al., 2006) and educational institutions (e.g. Thomson, 2017). This theory can be also fruitful for FL education like other fields of education. FL learners often have limited occasions to use their FL in the immediate local communities outside their classes (Ortega, 2007). Using insights from SL and CoP studies, FL educational practitioners may better facilitate the opportunities to not just learn but use the FL for their students in their classes.

Studies Informed by Communities of Practice

To date, studies informed by CoP have investigated some cases of classroom language learning. In summary, they have illustrated that the success in participation is associated with the success in learning, and in turn, the failure in participation is associated with the failure in learning (e.g. Lamb, 2013) although this may be a simplistic understanding (e.g. Morita, 2004). Such studies have also discussed environmental factors associated with the success and the failure of participation. In these discussions, scholars started to argue that a classroom does not function as a CoP in its original sense (e.g. Haneda, 2006). It is due to several misalignments between classroom reality and CoP as a theoretical construct e.g. membership makeup, frequency and duration of regular interactions and ways to start and end a group (Kojima & Thomson, 2019). This suggests that more FL education studies informed by CoP may need to address teaching and learning happening outside the institutional classroom settings.

To date, a few studies have explored out-of-class learning using CoP in the field of FL education. These studies suggest that CoP has its explanatory power for out-of-class learning of FL learners (e.g. Shimasaki, 2014, Zappa-Holman & Duff, 2015,

Thomson & Chan, 2017). Further, these studies offer useful insight into pedagogical implications. Nevertheless, studies of individuals like facilitators who are concerned in this study are still scarce in this field. Therefore, this study aims to add a case study of the facilitators who engaged in learning opportunities outside the official university course framework to the relatively unexplored area of scholarly knowledge with a focus on facilitator participatory experience and identity negotiation.

Methodology and Methods

This study is a case study making a qualitative inquiry. As a case study, this study is interested in understanding how the focal case is socioculturally constructed (Dyson & Genishi, 2005). Qualitative inquiry enables this study to explore emic views that inform "what is happening, what it means and its significance to the social group" from insider perspectives (Bloome 2012, p. 9). The qualitative data of this study come from two sources—online discussions in the facilitator group and facilitator weekly reflection reports. As the author was not at the research site at the time of data collection, his involvement in the facilitator group was partial, indirect and passive. That is, direct observation was not possible. This study acknowledges that these aspects of data collection are the shortcomings of this study. To overcome these, several emic views are simultaneously accessed through two types of data sources offered by different facilitators. The data were collected over fifteen weeks during an academic semester in 2019.

This study employed thematic analysis (Nowell et al., 2017) to explore how the group of facilitator changed, how the facilitators changed and then how the group and the individual members mutually influenced each other. The SL and CoP together with the purposes of the study guided the inductive analysis. The process-oriented analysis identified seminal themes in the data sets regarding the purpose of the study.

Research Context

The research site of this study is the fifteen-week undergraduate Japanese course for third-year students at an Italian university. The course employing a dialogic pedagogy thematized "my future" as its main focus. The students were requested to ask themselves why their goal or dream in the future would be important to them. Thus, the course did not favor the students saying—"I want to do this in the future as I like it". Asking themselves and others "why" was considered vital for a reciprocal process of thinking, becoming aware and self-discovery. This self-discovery is assumed challenging to achieve individually and thus dialogue was integrated into all aspects of the course. Simultaneously, the dialogue was considered essential for a community building in the course. Without the community building, their dialogue was thought to remain surface-based one. These values were presented in the course for the students but more importantly, actively discussed in the facilitator group. Sixty students initially attended the course and then fifty-one students completed the course. This decrease in the student number is normal at an Italian university where attendance is not compulsory to gain credits from courses.

In the course, the students were asked to develop a report over the semester and give a presentation at the end of the semester. The report included 1) a motivational text—stating the goal or dream in the future and why it is important to them, 2) a dialogue

report—providing extracts of out-of-class dialogue transcript and relating them to their chosen goal or dream and 3) conclusion—stating the change which they underwent through their dialogue. The report was rewritten regularly while repeating in-class dialogue with classmates, the course teacher and the facilitators. The out-of-class two-hour dialogue was designed to facilitate student deeper engagement with their ideas. In week fourteen and fifteen, the student presentations as part of formal evaluation reported the three components to receive further feedback. The feedback was expected to be used for polishing their final reports submitted to the self-, peer- and teacher-evaluation. The students decided the marking criteria of the course on their own in week twelve and thirteen for the evaluation. The 60% of the total mark came from the teacher evaluation and 40% came from peer- and self-evaluation.

Research Participants

The facilitators—the main focus of this study—supported the dialogic teaching and learning by being involved in both teaching and learning as active participants. The total number of facilitators who regularly attended the course was thirteen. Broadly speaking, they had an interest in FL education as they learnt and/or taught Japanese as an FL, Korean as an FL or Italian as a local language at the university. Five were paid-internship students, one wanted to apply the approach to another language taught at the university and the rest wanted to support the teacher, the students and the course. However, it should be noted that the reasons for their voluntary involvement are not fully known—the reasons might have affected how the facilitator community functioned and how each facilitator experienced participatory learning. The facilitators joined one of the groups each of which had four to six students.

In general, the facilitators were those who had experienced the past courses with a dialogic pedagogy. Some of the facilitators were experiencing the pedagogy as the students were. Regardless of their backgrounds and experiences, most of them completed the same activities required for the students to complete. Whilst doing so, they learnt and practiced their facilitation. While such simultaneous learning and practice occurred in the classes, the reflection of their facilitation was encouraged during frequent face-to-face and online discussions, which is the first data set of this study. Nine had an Italian background, two had a Japanese background and one had a Korean background. Their communication during the discussions was either in Italian, Japanese or mixed between these two[1]. In the discussions, the facilitators became increasingly familiar with facilitating dialogic teaching and learning e.g. understanding how to ask questions in a certain way. After every weekly class, they were asked to write a reflective report about the students, their facilitation and the course, which became another data set of this study.

The focal student—Andrea[2]—was Italian and one of the undergraduate students in the facilitator cohort. He had had no experience as a facilitator prior to the course under this study but he had attended a short-term seminar series about the dialogic pedagogy. He led the facilitator group upon the teacher's request, submitted most of the weekly reports and remained active in and outside classes. This leadership, responsible engagement and activeness inform that he assumed himself with a certain level of

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[1] These are translated into English by the author.
[2] Pseudonym

familiarity with and knowledge about the pedagogy. Last but not least, he seemed to have the strongest interest in language education among the facilitators. This study explores his experience as a focal facilitator in the course to understand changes in his participation and identity regarding FL education while examining how the community of which he was part shaped his experience.

Findings

Learning Context: the Facilitator Community

The first part of the finding section illustrates the change of the facilitator community. Two excerpts—one at the beginning and another in the middle of the semester exemplifies the change.

During the first few weeks, the facilitators carefully listened to the teacher to comply with what the teacher expected them to do. The interactions among the facilitators seldom occurred. Occasionally, a few facilitators asked questions to the teacher. Even when questions were asked to the teacher, they were mostly to clarify or confirm the intention of the teacher instruction. These are observable in Excerpt 1 below.

Teacher	*Please wait a bit [to read the reports that the students have written]. It will take a bit more time until I decide the group for each facilitator.*
Facilitator A	*Yes, I understand. Can the students who did not attend the class still read them and send [their comments] via email?*
Teacher	*Of course.*

Excerpt 1: Interactions in the facilitator group in week 3

In these weeks, the domain of the facilitator group was to understand the teacher instructions and follow them as expected. Their community was being formed while, whether overtly or covertly, recognizing the authority of the teacher. As a result, the interactions were often limited to the unidirectional ones between each facilitator and the teacher. Their practice was to listen to and confirm to later perform what was told to do.

Several weeks after the semester began, the facilitator group started showing a noticeable change. For example, not only the teacher but also most of the facilitators started to initiate discussions and suggest actions to take. Their discussions often explored the meanings the actions would come to have and whether doing the actions would be necessary. Their primary interest in the discussions appeared to be whether their actions were meaningful for not themselves but the students. They did so frequently even without the teacher. In Excerpt 2 shown below, they concluded that the action proposed to take by one of them (i.e. commenting on the student motivational texts) was unnecessary and thus they decided not to do it. The conclusion was drawn based on the evidence—one of the facilitators checked whether the students had submitted their assignment and confirmed the students did without any instruction from the facilitators.

Facilitator B	*I am sorry but I am confused. What will be the purpose [of commenting on the student motivational text]? I do not see any necessity to comment on the motivational texts today given that the students would not reflect them to their writings. That is, is it that urgent?*
Facilitator C	*If I can rephrase, [by doing so] we can provide topics [by giving comments] for the students who do not know what to write. ... This is my opinion. What do you guys think?*
Facilitator A	*The due is tomorrow, so it may not be urgent. But if we comment on their motivational texts early, they have more time to think of it. So, let's write our comment.*
Facilitator D	*I don't think that we have to be worried too much. When I checked, some students already uploaded their motivational texts and the numbers are increasing. [Regarding submitting an assignment in the last minutes,] aren't you the same? I checked yours just now but you have not uploaded yours.*

Excerpt 2: Interactions in the facilitator group in week 7

At this stage and thereafter, it seems that their domain concerned how they could support the students. More varieties of facilitators expressed opinions and then the community where they could constructively exchange opinions was growing. Further, the practice turned to be initiating actions, asking clarification for the meanings and reasons behind the actions and suggesting what to do or even not to do drawing upon evidence.

Facilitator Experience: The Case of Andrea

Now, this study shifts its focus to Andrea. Observing online discussions, emails and weekly reports informs that he was actively involved in the facilitator group as well as the classes from the beginning to the end of the semester. Such active involvement appeared to lead him to rigorously negotiating and dynamically changing his participation and identity in the course. As evident in the range of emotion seen in his statements presented below, he did not seem to expect such negotiation and change.

In the beginning, he positioned himself as the one who would give instructions to the students in his group. It is evident in his repeated uses of the term—"*Shidōsuru [instruct]*" (11 February) in his weekly reports. Furthermore, over a month, his desire to put the students under his control was evident from the repeated use of causative verbs such as *"Saseru [make]"* in his reports. For instance, he states as follows:

*"[In] this class [it] is not enough saying 'I like something' but it is challenging to **make the students think** of what they feel. I came to understand that completing the ultimate goal in our task (**making the students think**) is impossible in one class. ... I also need to **make all the students in my group speak up** equally. ... They do not listen to my follow up instruction even when they do not understand the teacher instruction. ... How can I **make them think**? How can I **make them speak up**? How can I interfere further whilst maintaining my group as a comfortable one?"* (11 March, emphasis added by the author)

While his desire to make the students follow his intention—perhaps as he, as a student, attempted to do in the facilitator group—was noteworthy, he also illustrates his intention to maintain his group as a comfortable one, which is seen at the end of the excerpt above. This is the first instance where he presented his concern about the relationship between not only his instruction and the student resultant action but also his action and the group atmosphere.

Two weeks after, he could not concentrate in the class as he felt somehow exhausted. He did not participate in the class as he usually expected the students to do. Then, he had to ask himself—*"How would the students emulate me if I would not show the effort to be actively involved in the activities?" (4 April)*. This suggests that he still holds the image of facilitator as an ideal model for the students to follow. However, at the same time, undergoing such a less active and less responsible participation asked him to reflect on that the facilitators including him criticized less active students in the course without considering what was actually happening to each student. That is, he began to consider that each student may have some reasons to be less active in the class. This led him to further question himself about what it means to be a facilitator as well as a teacher. He wondered whether failing to be an ideal model should be an obstacle of instructing students. Eventually, he wrote a question—*"What does teaching mean in the first place?"* (4 April) which he has not answered as far as the author knows. Reflecting upon his facilitation in the classes resulted in addressing his very fundamental presupposition about teaching and learning in language classes.

In the following weeks, he started to show a different approach to his group and the students in the group compared to the one perhaps labelled as an instructor. First, he recognized the connection between the positive atmosphere in his group and an active and confident engagement of a student who used to remain quiet. Regarding this, he stated—*"I felt a sense of satisfaction and accomplishment"* (8 April). Further, he attributed a student *"nervousness"* instead of her *"insufficient language proficiency"* to her silence in the group (15 April). Without direct observation, this study is not able to affirm whether he changed his way of participation in his group. However, at least from Andrea's point of view, it is evident that the atmosphere of the group turned to be positive and then the atmosphere encouraged the students who had remained hesitant to actively participate.

At the end of the semester and thereafter, Andrea repositioned himself as a facilitator. He began to see himself as not the one who *"looks down the students from the above"* but the one who walks with the students as he puts it—*"all of us are walking this path together step by step"* (17 May). Initially, he envisioned a facilitator as an ideal model for the students to emulate. That is why the ideal facilitator can *"instruct"* the student and the students can *"emulate"* the facilitator. At this point, however, he saw making mistakes as an ordinary habit for the teacher, facilitator and the students. If so, he thought that all of them including himself could remain calm to communicate with each other to redo what initially went wrong altogether. This type of communication might be understood as what they wanted to call dialogue in the course.

Concluding Discussion

Drawing on SL and CoP, this study has explored the facilitator group and one of the facilitators—Andrea in the dialogic Japanese language course at an Italian university.

This study first focused on the change which the facilitator group underwent to demonstrate how the contexts of learning for each facilitator was formed, negotiated, changed, and sustained. Regarding the domain of the group, it was identified that their focus shifted from listening to and following the teacher instructions to thinking of and discussing how their action can support the student dialogic learning. The community of the group became more and more dynamic as more varieties of facilitators expressed their opinions to each other rather than directing their questions and opinions only to the teacher. The quality of their interactions—practice—changed from hesitant and confirmatory ones to active, autonomous and critical one. Previous studies found that classrooms in reality may not become resemblances of the original CoP due to some misalignments between classroom reality and the CoP (Haneda, 2006, Kojima & Thomson, 2019). However, in this study, the facilitator group which was embedded in the course structure but had less institutional regulations may have exploited its potential and become what this study may call "a facilitator CoP". Drawing on the findings, this study suggests designing a learning environment by interconnecting different communities e.g. the ones focusing on actual practice and the ones focusing on reflection in the case of this study. Participating in different but interconnected communities successively may enhance participatory learning experience e.g. critical reflection of one's own thinking and actions compared to the stand-alone learning experience in each separated community.

This study then shifted its focus to the focal facilitator—Andrea—to understand the participatory learning experience of peer-facilitator who are involved in FL education. His change over the semester was notable. Initially, he established the image of the facilitator as the one who would *"instruct"* the students. The facilitator was an authoritative figure despite its name aims to promote less authority (O'Dwyer, 2006). It appears normal that students attach such an authoritative image—which may often originate from the typical image of teachers—to facilitators when they are assigned to be the facilitators. Especially when the discussion about a clear distinction between teachers and facilitators is absent in classes, such a case can be more likely to occur. However, Andrea had to question himself repeatedly about the authoritative image while he as a facilitator underwent a range of emotion from frustration, confusion and satisfaction over the semester. No matter what kind of emotion he underwent, what is important to remark here is that the shift of his facilitator image—from the facilitator as an instructor or controller of the student learning to a supporter of the student learning—seemed to resonate with the change that the facilitator group underwent. Thus, this study drawing on CoP and SL (Wenger et al., 2002, Lave & Wenger, 1991) underlines the significance of social context for the participatory learning experience of individuals. It is commonly understood that teaching through words—instruction, explanation and clarification—have an educational power. This study indicates that teaching through facilitating participatory learning experience can equally have its unique educational power.

This study suggests that outcomes explored from a participatory learning perspective may not be easily and immediately observable unlike outcomes explored from an acquisitional learning perspective. Until the end, Andrea did not overtly state any answer to his fundamental question—*"what does teaching mean in the first place?"*. Indeed, Andrea appeared to start demonstrating the unverbalized thoughts through his actions in his group already in the midway of the semester. For instance, it was evident that he paid more attention to the student emotion and group atmosphere than

student competences in Japanese. Nevertheless, he did not reach a conclusive answer to his question even after the semester ended. Andrea may still think about his answer to the question. Drawing on Andrea's experience, this study asks teachers, students and even the general public to stop expecting that outcomes should immediately become observable. Today, it is often supposed that teachers should reveal and students should demonstrate learning outcomes within a short period especially in the ten-week to fifteen-week term/semester system which seems to be common for many institutions. The outcomes of learning designed based on the acquisitional learning perspective may be suited to meet such a demand since testing whether students have memorized pieces of knowledge is often integrated. However, it may not be ideal to apply such an assumption when exploring the outcomes of learning as participation (e.g. Morita, 2004) as doing so might result in preventing teachers and students from addressing complex and challenging but crucial and meaningful questions that require a long time to answer. Further, not only may the outcomes but also the process of participatory learning need to be carefully considered as the value of participatory learning appears to be embedded in the wide range of emotion and experience which individuals, like Andrea, have to face. To conclude, this study suggests changing an attitude towards learning outcomes because now, students, as Andrea did, often have to encounter and address questions that have no definitive answer.

This study focused on one facilitator group and one facilitator in the group. While this study offers insight regarding peer-facilitator learning experiences in relation to FL education, one case study is insufficient to apply the insight coming from their experiences to wider contexts. Therefore, more and more future studies about peer-facilitators are called for to actualize quality FL education across contexts.

Acknowledgements

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No-Level Brick Foreign Language Education: Definition of the Field and Explanation of the Purposes – Japanese Language Classroom as Case Study

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Abstract

Today, we frequently observe social discriminations. These are tightly connected to stereotypes and intolerance toward others' values differing to ours. Many of us do not have/take the chance to become aware of and question even our own values and ideologies behind them. Dialogue through a (foreign) language is considered as a 'must' toward social cohesion and mutual understanding (Council of Europe 2001). In much needed citizenship education, foreign language teachers can play a key role (Hosokawa, Otsuji, Mariotti 2016). This paper aims to demonstrate that 'active learning' language classes where learners are asked to think and choose the theme which each of them cares, whatever the themes and language proficiency levels are, can empower learners and teachers to became aware of their own values given they are guided to question the reasons behind their choices and to share their thoughts in meaningful dialogues (Hosokawa, 2019) between them and outside the classroom. This approach can move our classes toward more inclusive ones. The data to support the claim came from interviews, participant observation and submitted texts in three case studies: absolute- beginners (2016), undergraduate (2018), master (2019) Japanese language courses at an Italian university. The analysis focuses on a) interrelations between language proficiency and chosen themes; b) changing awareness toward own and others' values; and c) relationship with peer-facilitators. The showcase will lead to No Level-Brick (NoLBrick) language education project, which suggests a de-standardized transformative-critical language education, where teachers and learners are seen as subjects of a reciprocally empowering citizenship formation process.

Keywords: Nolbrick, critical language pedagogy, Japanese, social responsibility, inclusiveness

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Introduction

The present paper is part of a wider panel jointly presented at the International Academic Forum Hawaii 2020 on field and purposes of NoLBrick transformative language education, investigating how students expectations toward FLE too often refrain them to afford critical thinking and how learning, if seen as participation process, can bring students to become responsible transformative actors in our society.

This panel itself thematized the "No-Level-Brick" dialogic foreign language (FL) education which concerns not increasing learners' language proficiency-levels but encouraging learners and teachers to co-engage with critical thinking using the FL. Presenters considered that engagement with critical thinking can empower learners and teachers to become aware of their values and responsible for co-creating and co-sustaining a convivial society. Dialogue in an FL can be vital to strive to achieve this end in this increasingly interculturalizing society.

The panel began with questioning the use of prescribed language proficiency-levels as part of a common educational practice in the field of language education. The proficiency-levels may be practical in evaluating and ranking language learners. However, the exclusive focus on the proficiency-levels often overlooks other key aspects in language learning and practice (e.g. contents) and furthermore may prevent individuals from engaging in meaningful dialogues and becoming responsible citizens. What happens if we shift our focus form the proficiency-levels to other aspects?

To answer the question, I designed and implemented the No-Level Brick dialogic Japanese language courses at an Italian university. In my presentation I explained the need for such educational approach and how it can contribute to reciprocally empowering citizenship formation; Alessandrini reported the challenge which the approach may face due to the students' expectations towards language learning and teaching (*No-Level Brick Japanese Language Education: Expectations Toward Language Teaching*); Kojima focused on the emergence of Communities of Practice (Wenger et al. 2002) where the teaching team dialogically explores what it means by learning and teaching an FL (*No-Level Brick Japanese Language Education: Understanding Learning as Participation in Practice Through a Communities of Practice Perspective*).

No more wall, nor bricks. Dialogic Foreign Language Education

Recently almost every paper of mine starts quoting Pink Floyd's song: "We don't need no education / We don't need no thought control / … All in all it's just another brick in the wall. / All in all you're just another brick in the wall" (1970). That is because it summarizes very well my research question "How to empower FL teachers and students *not* to become *another brick in the walls*?"

Critical pedagogy-transformative/problem-posing education aims at empowering students and teachers to individuating, reflecting and questioning upon the ideologies and practices that make them or others feel oppressed and restrained (Freire 1968). We may consider Foreign Language as a privileged field in education, since during foreign language classes students and teachers can discuss any kind of content, as

suggested by Critical Content Based Language Education (CCBLE; Sato et al., 2015) and the Post-communication turn. Farren (2019) outlines some of the most relevant studies about transformative pedagogy, from the perspective of its intercultural and moral-philosophical foundation that underpin autonomous and inter-dependent (Little, 2001) language teaching and learning.

Aiming at values awareness and responsibly co-creating of an intercultural and democratic society, suggest a shifting of focus from a vertical language proficiency labelling dividing wall, to a horizontal cohesion of teachers and learners as social actors, allowing them to accept responsibility for their teaching and learning choices. This suggests the need for a de-standardization and professionalization of teaching processes (Mariotti 2018).

While I identified the research question of my early career outcome BunpoHyDict (*A Hypermedia Dictionary of Japanese Grammar*, now JaLea 2016) as "how to make students remembering grammar faster and beyond exams term?", my actual utmost aim was developing a tool that could offer freedom of choices in expressing ones thoughts in a foreign language. Such hypermedia grammar dictionary requires autonomous responsibility of (teachers and learners) users' choices. The above research question had relegated me, as non-native learner, to a subaltern position against the 'native speaker myth', while I was actually looking for teachers and learners' own values awareness and responsibility in own learning and teaching choices. Exactly as Gramsci (1975) conceptualizes in his "hegemony theory", formulating a-posteriori BunpoHyDict research question, I had internalized, and I was en-joying, the dominant value of 'native proficiency level' ideology, against my own (non-native) sake, following the obsessive and oppressive grade-system I had always felt uncomfortable with. But research motivation was such a personal and strong one, that when I was involved in the dialogical active approach of Hosokawa (Hosokawa, 2004) at Waseda University, I finally realized how BunpoHyDict non-linear approach springed from the heartfelt need of a more personally tailored (autonomous and free) learning path, which took me to a new perspective: The 'real' research question I should have asked to myself was: "for the sake of whom am I, or should my students be, obsessed by grammar items divided by levels? I had not been sufficiently trained in critical thinking but only in following system's instructions, without questioning them or my own well-being: I was "just another brick in the wall" without critical literacy.

Dialogue as freedom to be mutually responsible social actors

The feeling of freedom and empowerment I could experience writing and discussing my thoughts (Mariotti, 2008) was so strong that I started to elaborate Hosokawa's approach as soon as I had my first class back in Venice in 2011. The sense of discrimination and inadequacy that standard hierarchic levels often produce, somehow melt away during taught classes, giving some space for acknowledging owns and other values, through in-class and outside-class activities in Japanese (Mariotti, 2016). Encouraging dialogue through FLE can bring to critical awareness and questioning our world own views while welcoming others, mutually seeing each other as responsible member of the same community/society, empowering both from concretely act toward social integration instead of toward divide.

Since in every conference presentation about encouraging dialogue as form of critical awareness, the main objection I had received was about the concrete possibility of conducting a dialogic foreign course at zero-beginner level, I will bring the focus on three recent case studies that lead me to consider the need for a no-level Foreign Language Education:

1.   *Action Research Zero* (Sept. – Dec. 2016): a volunteering workshop for zero beginners of Japanese (Mariotti& Ichishima, 2017).
2.   *Undergraduate 3rd Year* (a.y. 2018/19): a mandatory Japanese Language Course for undergraduate students in their 3rd year.
3.   *Graduate 2nd Year* (a.y. 2019/20): a mandatory Japanese Language Course for graduate students.

Purpose of the courses was reaching a responsible critical awareness upon own choices. The common aim was writing a final report through a spiral dialogic process. Learners were requested to write an initial motivational text; have dialogues in & outside of the classroom; give an oral presentation; complete a final report and finally elaborate a self and peer evaluation. The final delivered reports consisted of a motivational paragraph, a dialogue report, and conclusions. In the motivational paragraph, the learners had to describe the relation between the chosen theme and themselves, thinking about the reason why they had chosen such theme. For the dialogue report, they had to choose one person to discuss the motivational paragraph and further reflect on themes and choices. Thereafter, they had to summarize the dialogue contents focusing on what they considered to be 'turning points' of the discussion, commenting on the reasons for selecting such quotations. Finally, they had to write conclusions drawn from their initial motivational paragraphs and the report of the whole dialogue processes in and outside of the classroom.

Upon report completion, students had to present to the class, changes that eventually occurred during the whole process, specifically before and after dialoguing inside and outside the classroom. Lastly, students had to discuss and decide criteria for self and peer evaluation, i.e. reflecting upon what they considered most relevant to them. The evaluation criteria chosen by the class, may be summarize as: 1) originality of the final work (would the delivered content be written by any other person than the writer?); 2) consistency of theme development (were motivational text, dialogue and conclusions logically connected?); 3) participation (was the student an active participant to online and in-class discussion, accepting responsibility in stimulating colleagues participation through questions aimed at awareness?); 4) comprehensibility (had the student engaged in finding the best way to convey his/her own ideas, checking grammar and readibility?).

After the end of the course, a last reflection upon the whole process was requested, together with the permission to publish the work online. Agreed works can be found at <virgo.unive.it/mariotti>.

The analysis of the three case studies focuses on:
a) interrelations between language proficiency and chosen themes;
b) changing awareness toward own and others' values; and
c) relationship with peer-facilitators.

Case study 1: Action Research Zero ARZ (Sept. – Dec. 2016)

The course was organized and coordinated in 2016 by Ichishima (Akita University) and Mariotti, supervised by Hosokawa (Waseda University), at Ca' Foscari University of Venice (Mariotti &Ichishima, 2017). It gathered 15 volunteering freshmen in Japanese Language, who were divided into 4 groups, with one facilitator each. Facilitators were 3 M.A. students, 1 native speaker guest, and 1 M.A. experienced in the dialogic teaching. Facilitators were not requested to write a report, but only to help in questioning the reasons of each student choice. The output of the course were individual presentations, individual reports and a final reports collection. Upon course completion 3 internship credits would be given if requested. Since the course was not a mandatory one, nor would give any mark, we can assume students had an extremely strong motivation to participate and did not drop off until the end. Dialogic activities were conducted inside the classroom, and online through a dedicated Google Group.

a) interrelations between language proficiency and chosen themes

In this course, titled *XY and myself*, participants were asked to choose a theme of their interest. The 15 chosen themes were as shown in table 1:

Report	Title in Japanese	Translated Title
1	ゲンダイアートと私	Modern art and Myself
2	ドラムと私	Drum and Myself
3	バスケットボールと私	Basketball and Myself
4	日本のしと私	Japanese poetry and Myself
5	ストリを書くことと私	Writing story and Myself
6	ファッションと私	Fashion and Myself
7	私の猫と私	My cat and Myself
8	星を見ることと私	Watching stars and Myself
9	描くことと私	Drawing and Myself
10	ロックの反抗と私	Resistance rock and Myself'
11	ゆびわものがたりと私	*Lord of the Rings* and Myself
12	パリのルブルびじゅつかんと私	Louvre of Paris and Myself
13	ハリーポッターと私	*Harry Potter* and Myself
14	空手と私	Karate and Myself
15	だいにじせかいたいせんと私	World War II and Myself

Table 1: Student themes for ARZ course

None of the participants refrained from choosing their favourite theme because of their scarce language competency, demonstrating that language proficiency has no influence on what a person genuinely considers worth of discussion or interest. Furthermore, I supervised Bartolommeoni M.A. thesis (2017) which gave evidence of how the grammatical items students need to express their thoughts, not necessarily match with the level-order presented in textbooks, based on items sequence too often decided by native language speakers only.

b) changing awareness toward own and others' values

In the fifteen meetings ARZ course, beginners had to face the reasons of their choices, dialoguing with others, while looking for the best way to ask others the reasons of their choices too. The mutual engagement helped all participants to overcome shyness in opening themselves to what we can define as a 'personal-intercultural exchange', along Holliday definition of 'small-culture' (Holliday, 1999), Byram's concept of 'intercultural encounter' (Byram et al., 2009), and Hosokawa's 'individual-culture' (*ko no bunka*; Hosokawa,2002).

As of Figure 1, Student A highlighted how the dialoguing process was helpful in understanding "deeply"' what he/she has chosen to talk and write about, and how perceiving 'drum' as 'obviously part of himself' was the reason for finding difficult to explain his relationship with music. The problem to be solved was clearly not a linguistic proficiency, but a content to convey, whatever language he would use

意見をもらって 考えたこと	この対話のおかげで、私はしみじみと私のテマをわかりました。そして私の観念は変わりませんでした。私と音楽の関係は説明するのが難しいです、でも私にとって当たり前です、音楽は私の一部からです。ドラムは私の一部です、そして叩くことは私を生き生きと感じさせる。

選びます　scegliere　　他楽器　altri strumenti　　試みる

provare　　　後　dopo　　奇しき　misterioso　　楽器　strumento

Figure 1: Understanding my drum passion (Student A)

"Thanks to this dialoguing I could understand deeply my own theme. I didn't change my ideas. It was difficult to explain my relationship with music, but it is obvious to me. Because music is part of myself. The drum is a part of myself, and playing it makes me alive". (Student A. Comment on the course, Japanese to English, my Translation)

結論

このアクションゼロの作品は反省に根ざします。キーワードがあります、そしてキーワードはこの反省の主なポイントを表します。最初のキーワードはリズムです、これは私と世界の接続からです、リズムおかげで私は調和を見つけます。二番目のキーワードは感情です、音楽の心は感情からです、メンバーが感じる気持ちです、そして音楽を通じて与えられた感情です。いうまでもなく、三番目はドラムです、私の楽器からです、それからこの大きい反省の出発点からです。

このプロジェクトのおかげで、私は自分のテマについて考えます、はじめに私はテマを簡単だと考えました、次にテマを深く調べました、だから私はテマについて多くのことをわかりました、しかし、なによりも自分について多くのことをわかりました。ドラムについて考えはありました、でも、今私と私の楽器の関係を深く理解しています。リズムと世界の関係について話して、考えました。そして私と私のいとこを比較しました、これも私を手伝いました。最後に、私の考えは変わりませんでした、観念は同じからです。前にこの観念はわかりませんでした、そしてこの探査の後に自分自身をもっとはっきりと見ます。

作品 lavoro 反省 riflessione 根ざします venire da 主なポイント punti principali 表します rappresentare 最初 il primo 接続 collegamento 見つけます trovare 二番目 il secondo 通じて attraverso 与える dare 出発点 punto di partenza

"My Action Zero work roots on reflections. Has keywords. And these keywords display those reflections. The first keyword is rhythm. This is my connection with the world. I find peace thanks to the rhythm. The second is feeling. The soul of music is feeling, the feelings of the members, and the feelings felt through the music. Needless to say, the third keyword is drum. Because it is my instrument, and it was the starting point of such big reflection.
Thanks to this project I think about my theme. At first, I thought it was a simple one. Then I researched more. In so doing I could understand more about my theme. But most of all, I could understand a lot about myself. I had thoughts about drum, but now I can understand more about my relationship with my instrument. I dialogued and reflected upon the relationship between the rhythm and the world. I confronted myself with my cousin, and this helped me a lot. My thoughts didn't change, and my ideas are the same. But before [of this course] I didn't know my own ideas, and after this research I see myself

Figure 2a & 2b: Student A 'Conclusions'

In Figure 2a and 2b, the process of discovering the reasons for choosing 'drum' as theme to write and dialogue about, activated a self-understanding and helped to 'know his own ideas', questioning them and, in so doing, taking responsibility for his own choices.

c) relationship with peer-facilitators

Tutors in ARZ project were not yet named 'facilitators', nor were they all peers. While supporting students' dialogic activities, they were considered at first only 'grammar living-dictionaries', but lastly became friends (Arleoni, 2017). It is worth to note that the four tutors-facilitators were not participating in writing their own reports, and only two out of four had previously experienced such a course. They were selected upon their willingness to participate in such experimental method, and to teach Japanese in high schools or privately. Due to her previous experience in such course, T1 was extremely supportive but had to leave for a job after the first intensive week, leaving her student group to be helped by a newcomer T2. T3, used to be tutor for traditional top-down textbook language teaching, had been skeptic till the end of the course, T4 was skeptical at the beginning, but facing the impressive results, decided to write a M.A about the ARZ. T5, had no experience of the course and due to her fluency in Japanese Language felt more walking-dictionary with her group.

We can get evidence on how the relation between tutor/facilitators have been empowering through students and facilitators reports (figure 3: "I would never have thought I could write such long report, nor that I would have been able to talk about this subject in Japanese" (S3). '[Acting as tutor in this course gave me] a little more confidence in Japanese, [now] I am not afraid of not being able to support someone who asks me, which I had 100% in Japanese before (Arleoni, 2017, p. 59).

こんにちは、ジュリアと申します。トトログループのチューターです。
ヴェネツィア・カ・フォスカリ大学大学院の2年生で、日本語を勉強しています。
ジェノヴァから来ましたが、今はヴェネツィアに住んでいます。
私の興味は言語学習と空想世界です。一番好きなことは旅行するのです。
修士論文を書くためにこのワークショップに参加したが、素晴らしい 経験になりました。

"Hi, I am Giulia, a facilitator. I participated in this workshop because of my Master Thesis, **but** it come out a wonderful experience!" (T4)
(Tutor 4. Online reports booklet presentation., Japanese to English, my translation)

Figure 3a & 3b: Tutor 4's surprise in the outcomes
of her experience participating to dialogic classes

Case 2: Undergraduate 3rd Year (a.a. 2018/19)

The first classes for the undergraduate Japanese Language and Culture course in 2018 registered a total number of over 60 students, while 48 eventually completed the activity. Together with students, 13 facilitators were involved: 6 of them were interns for the "No-Level Brick Transformative Language Learning" project funded by Ca' Foscari University of Venice (Mariotti PI). Among facilitators, 3 had partial experience of the course concept; the remaining 6 facilitators were experienced volunteers, and 1 was a non-experienced assistant. Those who had no previous practical experience of the course were invited to write their own report, which is understood not only as an individual but also as a collective process in the moment it is asked to present their thoughts to the other participants. Interaction would have been carried out not only firsthand in class, but also through Moodle online platform. The course would result in 18 ECTS as part of the undergraduate degree in Japanese Language and Culture.

a) interrelations between language proficiency and chosen themes

For the undergraduate course of the 3rd Year, I suggested to freely choose a theme, adding the subtitle "My future". Most of the 60 students were scared about thinking about their future while even if already at the last year of their undergraduate course, very few had already in mind what they were willing to do after graduation. Almost all of them lamented that it was difficult to explain their dreams and feelings, as well as their projects in Japanese, but at the end of the course, they admitted that difficulty was not about the language used for this activity but about the content itself.

1. "My Future: Study in Japan and find my way "
2. "My Future: Another day, different feelings- toward satisfaction"
3. "My Future: Hawaii's Dream"
4. "My Future: Every year my feelings change thanks to art"
5. "My Future: Following translation"
6. " My Future: Light: writing for freedom"
7. "My Future: What should we do to live satisfactorily?"
8. "Know Your Home, Know Yourself" "My Future"
9. "My Future: My Relationship with Art"
10. "My Future: New journey, new knowledge"
11. " My Future: Understanding Cultural Diversity"
12. "My future: teachers using interdisciplinary methods»
(… up to 51)

Figure 4: Samples from A.Y. 2018/19 report titles

As in case study 1, language proficiency did not refrain students from choosing abstract themes inquiring the meaning of their life and choices (*Figure 4*); rather they become aware and responsible of their choices through the dialogic process inside and out-side of the classroom.

b) changing awareness toward own and others' values

アニエセと話した時「本当に大切なことは私がわかることだったら、**どうして翻訳したいですか。**」ということを考えました。**その考えのお かげで**「やはり私のためだけではない」ということをわかりました。つまり、好きな 仕事をしたら、そしてその仕事は少しだけも**人々に役に立ったら、本当に嬉しいてで**す。

When I talked to Agnese, I asked myself: "If what's important to me is to understand, *why* do I want to translate?". Thanks to that thought, I understood that "it's not really about me only". In other words, if I do a job I like, and that job can help others even just a little bit, then I'll be happy. (S4) (Student 4 comments on the course, Japanese to English, my translation)

Figure 5: Dialoguing to reflect upon our choices

As of Figure 5, student S4, passionate for translating Japanese novel from into Italian, discovers that her passion was not just about translating in itself but about helping others offering them the possibility to enjoy a genre of literature not yet reachable to non- Japanese speakers.

The same awareness about owns emotions and dreams, was reached by S5:
"I realized it was important the dialogue we had in class too. At the beginning I didn't think so. […] I never had such an experience. […] My awareness about my future changed during the course […]. When talking about the change in my future projects, I become more confident. Not a generic confidence but I was confident about my dream about the future." (S5)

c) relationship with peer-facilitators

The role of facilitators, as experienced peers or native speaker guests helping to activate the maieutic process to "stimulate students to question themselves and explore the target language" in 2018 undergraduate course, has been analysed by Ligabue (2019) and Alessandrini (2020). I want to highlight here how actually, not only the facilitators, but rather the dynamic developing internally to the whole group, was considered by students a main activating process of self and other discovery.

My group pulled me out of my comfort zone. (S6)

> It was not easy to find the right words to explain myself. […] I didn't want to open me up, but I finally was able to understand what I wanted and why. […] It was easy to talk to my group members. […] When finally, I choose to open that drawer, I could find more self-confidence. (S7)

> So, I became nervous and thought, 'I can't do that'. I wasn't very confident because I didn't think I was good at Japanese, but thanks to the members of the group, I got out of my comfort zone. Everyone was really kind and always helped positively and it was easy. So, I was able to speak in. Japanese without worrying about being wrong I think this is a very interesting and useful experience. The reason is that I was able to grow personally by comparing with people, writing my own motives, and dialoguing with them. (S6)

> Thank you Kyoshikai members! I loved your comments and enjoyed the process! (S8 comments on the course, Japanese to English, my transltion)

A strong difference in students' motivation between the case study 1 and case study 2 undergraduate course, was due to the mandatory character of the latter. Students had to write the report and follow the syllabus in order to obtain marks and credits. At the beginning of the course, while participation in the case study 1 was supported solely by the students will and pleasure to widen their language competence, for participants in case study 2 attending the course was a need and a duty to completing their university career. Still, some of them indeed got passionate about the process thanks to the relationship they could develop with facilitators. A key factor in relating to the in-class process and change of power-balance, may be seen in that non-experienced facilitators "supported the dialogic teaching and learning by being involved in both teaching and learning as active participants" (Kojima, 2020). Power relationship then divert from the axis of language proficiency or from the grading teacher-student axis, empowering students with the freedom, as well the responsibility, to feel as a whole person capable of concentrate on the contents they wanted to convey, instead of feeling a lack of thinking power because of their 'insufficient' language proficiency.

> "Since the only limitation was the number of Japanese characters, I could freely talk about my dreams and I was happy. Furthermore, reading classmate motivational text was extremely interesting. […] Writing the motivational text was very important to me. Not only for my Japanese, but because reading the projects and aspiration of friends was an encouraging experience, and that personally was the most pleasurable activity." (S9)

"I could see my dreams and goals from other perspectives with the advice, questions and opinions of my classmates in the classroom, I could consider what I didn't think about and to review and deepen my interests. […] Of course, we need old traditions to understand culture, but today we may have been influenced by foreign countries, so it is more important to study the traditions born from those influences. I would not write this after my dialogue, I would have never thought of it. […] I wrote that "comparing with others is really important for self-consciousness. Things can be found on the contrary." If you want to describe this course, I might say that. This is because the comparison between classmates and conversation partners has deepened the awareness about their dreams. When I compare my dreams with someone else's dreams, for some reason I increase my awareness about the dream I had". (S10)

Case study 3: Graduate 2nd Year (A. Y. 2019/20)

The 2019 graduate course in Japanese Language and Culture, had 20 initial attending M.A. students, and one first year B.A. student as a temporary guest. After 3 weeks (3 classes), students who were attending "to exercise the Japanese Language before leaving for an overseas exchange period", and two students who did not feel comfortable with the active participation method, dropped out. The class was finally composed by 11 active students, 1 B.A. and 7 facilitators. Facilitators were 1 Post Doctoral fellow, 1 volunteering M.A. Facilitator, 2 M.A. students in Foreign Language Education, 1 M.A. first year student in Japanese Language and Culture, 1 Korean Language Expert, 1 B.A. third year student. They were all experienced the method in the past, except Post-Doc and one M.A. students in Foreign Language Education. in the method. All student-facilitators were volunteering. The course output meant to be an oral presentation and one individual report, to be evaluated by peers (40%) and teacher (60%), and one final group report collection (no marks). Classes were conducted in classroom and online through Moodle platform.

a) interrelations between language proficiency and chosen themes

As for case study 1 and case study 2, M.A. students too did not refrain themselves from choosing a significant theme to write and discuss in Japanese. 5 out of 11 students had not actually yet passed the M.A. first year exams of Japanese Language, but still were willing to attend the class and enjoyed the transformative-critical pedagogy backing the method. meetings were recorded, avoiding two students who did not agreed to record research data. Students could change the initial report title, if they wanted, at the end of the course. Delivered students' final titles are as of Figure 6.

1. "Sightseeing and Stereotype"
2. "Dante into Japanese literature, and me"
3. "Visual System and Internationalization, Statelessness, Omnivores"
4. "My intuitive world-beauty and convenience of intent"
5. "Web novels and me" "Web novels and two critiques"
6. "The hidden value of tea - My interests and Japanese studies"
7. "A word that conveys pleasure. The relationship between telecommunications and translation- Toward my research theme"
8. "Relationship between youkai and folklore and society and language - Toward my research theme"
9. "Use of New Religion Anime and Manga- Toward my research theme"
10. "Gender Society and I"
11. "Toward a critical approach to the relationship between abortion and religion. —

Figure 6: M.A. 2019 course: Students' final report titles

b) changing awareness toward own and others' values

As the first two case studies, in-class, online and outside the classroom activities, guided students to reach awareness about their themes choice, and furthermore about the choice to actively participate, question and engage in dialoguing with peers and facilitators, as well as in establishing the criteria most relevant to them to be evaluated upon, and in evaluating each other.

> I am happy I could write about this theme [*manga* are usually disregarded](S11)

> I [finally] found the courage to ask explanations to my classmate. (S12)

While quite lost at the very beginning, due to absence of textbooks or manuals, students felt empowered by their own willingness to challenge and convey in Japanese thoughts and ideas most relevant to them.

I never wrote an essay like this one before, so I didn't know what to do. That's why it took so long to write a motivation statement. After writing and re-writing, it, I tried to have a more consistent dialogue. Talking about tea, why it's important to me, and about tea ceremony. I was finally unable to have meaningful dialogue because there always were other interesting topics, but not actually very useful for my purpose. Anyway, just after the dialogue activity, I was able to understand the purpose of this report, thanks to the teachers.

> The motivation statement title I chose at the beginning was "the four concepts of tea ceremony". I thought it was a way for me to tell everyone what was important to me. Therefore, the purpose of the dialogue was to find out how to make others understand that tea is important. I thought the tea ceremony was the perfect way to explain it. But after the dialogue, others were asked the question, "Why is tea important to her?" Thanks to that [seeing myself through others], I thought about my subject again. In the end, I think tea is a way to recognize yourself.

In other words, if I could tell others the importance of tea, I would probably be able to understand my habits and my feelings. And after thinking, I thought it was better to choose a more personal title. That's why I wrote the title "The hidden value of tea". […] When I talked to C. about those feelings and the feelings of exclusion, I was so happy that I realized that this was the topic I was really interested in. I always drink tea during breaks, so I feel that it has been excluded. I can't take a quick break without drinking coffee. Then in such cases I usually drink nothing. Of course, this is a small case of exclusion, but I am often uncomfortable in everyday situations. For a shy person like me this can be very hard. But I think everyone has a feeling of exclusion from time to time. […] because of exclusion, some people lose value or lose confidence. […] I think emotions like communication, collaboration and exclusion are related. […] Still, this topic is very broad and involves a variety of situations. For example, separation and oppression are issues based on exclusion. Unfortunately, I didn't talk well about this topic because I thought the above exclusion story had little to do with the tea ceremony and the four concepts [I wanted to write about]. […] I thought this was very interesting, and this report made me think about myself and was able to compare each other with many different people. I did not do this alone, so I taught how to cooperate as a team. And I think this activity has helped me become more open. (S 13. comment on the course, Japanese to English, my translation)

c) relationship with peer-facilitators

As in case study 2, while still having the role of experienced guiding peers, once participating in writing their own reports, and engaging in dialoguing activity, become a more 'reachable' and less frightening presence, especially when showing their weakness in the foreign language (Italian or Japanese), and sharing their motivation underlying their own report:

I have to say Mariotti's project was a very difficult experience for me. I feel that in this course was the worst student. In fact, I was not excited to participate in a course where I would be in front of my peers. Also, two years ago, I participated in a similar activity by prof. Hosokawa, but I had not completed. The activities I did in and out of class gave to students the opportunity to look back on how we had selected a research theme. Universities may not always apply our freedoms, but this course did. Through classroom activities, I opened up a bit with my previously unfamiliar classmates and at the same time listened to their experiences. I talked about my interests, and at the same time, I spoke Japanese with Japanese students. I saw the facilitators as something that made us feel frustrated. In my opinion, facilitators helped us in many cases, but I think it influenced our work. We students always face anxiety over professors' judgment and the fear of not being able to be understood by others. It took time to speak naturally with T and C, because I was worried to make some mistakes. On the other hand, for them nothing was risky. Only after the dialogue part, I really considered them members of the group. Perhaps the fear of failing and being judged inappropriate for the course has influenced my participation. There were many things that were difficult to study at the deadlines, but I had an

interesting experience. I guess I've done what I could, and I feel I've done a good job. (S14 Comment on the course, Japanese to English , my tarnslation)

	2016 zero beginners	2018 B.A., 3rd year	2019 M.A., 2nd year
Students	15	60 > 48	20 + 1 guest >> 11
Facilitators (native & non native)	4 (5) (3 M.A., 1 extern, 1 experienced post M.A) No Facilitators reports	13 (6 interns [3 semi-experienced], 6 experienced volunteers, 1 non ex. Assistant) Report required for non-experienced	7 (6 volunteers [1 Assistant, 3 M.A., 1 B.A., 1 Korean Expert], 1 PD non experienced) Report required for non-experienced
output	Presentation + report + report collection	Presentation + report (individual)	Presentation + report + report collection
credits	3 internship credits upon request (no marks)	18 CFU (partial marks); mandatory	18 CFU (partial marks); mandatory
method	Class & Google Groups	Class & Moodle	Class & Moodle

Table 2: The three case studies at a glance.

6. Findings and conclusions

The UNESCO report 2005 underlined the contemporary shift from an information society to a knowledge society, aiming at developing literacy for a lifelong learning and critical understanding necessary to act responsibly in democratic societies. IT and Artificial Intelligence surely help in mechanical translations from and into languages, and, together with increasing overseas mobility programs, suggest and support a new role of foreign language teachers for the so called next generations Z and Alpha (Mariotti 2017).

The playground is ready to welcome the actual reality: multi-level foreign language classrooms are our present but, due to a hierarchical proficiency level standard that see a native-like proficiency as the only desirable aim, they are still considered a problem to face, instead than a chance to take advantage from. Above data showed that focusing on what students have already (their ideas and thoughts), and on the necessary practice of self-questioning, applied to learners as well as teachers, can empower subalterns to find the words and courage to freely express themselves and responsibly contribute to their/our present intercultural societies, becoming aware of our/their historical positionality.

Questioning (inventorying) our own actions and thoughts to encounter and welcoming others is not an easy process. Challenging our own beliefs is as much needed as

harder than asking for easy instruction and textbooks. Foreign language classes can offer an open space to enjoy the process of expressing own thoughts through others, if only the dividing walls of proficiency levels can be overcome. It is not an easy challenge, since it means to give up the power of nativerism myth.

The three case studies, Zero-beginners, B.A., M.A., as well as Facilitators, despite participating into a Language Class, welcomed the free theme active learning transformative method, mutually becoming aware of their possibility and capacity of overcome fearness of judgment thanks to the theme they had chosen and to the relationship with peers and facilitators. No matter the level, they did accept responsibility in choosing the theme they cared about. No matter the level, they engaged in asking to others, looking for understanding or helping others understanding what they wanted to say.

The showcases suggests the need for a de-standardized transformative-critical language education, where teachers and learners are seen as subjects of a reciprocally empowering process, not by chance, as existing multi-level classes may suggest, but on purpose. The medium-language is no more just a tool, but builds the message itself: "If it were not in Japanese, I would not becoming aware of my thoughts like I did" (S14, M.A. 2019).

Misalignments between postmodernism purposes of democratic social cohesion and modernistic hierarchical linear teaching-learning are often observable, and concerning. More has to be studied about the effects of the modernist level-based assumption and a no-level FLE model (NoLBrick), to opens new horizons for a de-standardising of teaching, learning and evaluation.

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No-Level Brick Foreign Language Education:
Expectations Towards Language Teaching

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Abstract

This study explores dynamic relationships between students and student-facilitators, aiming to explore how student expectations influence their relationship and thus language learning experience and outcomes in a unique dialogic Japanese as a foreign language course at an Italian university. In adult language education, facilitators are expected to 'support' student learning achievement while respecting their autonomy and thus allowing students to take responsibility within the learning process (Umeda, 2005; Balboni, 2014). However, the facilitators are often seen to fulfill the role of the teachers who often take an initiative in guiding student learning. The dialogic Japanese language course in this research asks us to reconsider such aforementioned expectations towards 'facilitators' in language classrooms when the facilitators are peer-students whose role is to promote its dialogic approach in and outside the classroom. This qualitative case study (Duff, 2012) explores the data from the reports produced by students and student-facilitators, relating it to the researcher's participant observation and own experience as a facilitator within the course. This research found that the student expectations toward the facilitators were strongly influenced by how they positioned each other in the learning environment. Findings highlight the necessity for a de-standardization of language education in order to head towards a more inclusive, boundary-crossing learning environment.

Keywords: foreign language education, facilitator, student expectations, language pedagogy

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Introduction. Peer-facilitator: a companion against uneasiness?

This study aims to explore student expectations towards language education by considering their engagement with 'facilitators' in a dialogic Japanese as a foreign language (JFL) course at an Italian university. In particular, this research focuses on their relationships with 'peer-facilitators', trying to understand how they were socially positioned in the learning environment and their impact on the development and outcomes of students' experience of the course.

Two years ago, when I was still a master's degree student in this very institution and I had the chance to first participate to the "Identifying my research theme" course, based on "Japanese for thinking" (Hosokawa, 2004), I was able to observe how many students like myself found themselves baffled when they confronted with the novelty of the activity; however, their rejection of it as a language learning course has then led me to investigate the reason behind such reaction, driving my interest in student expectations towards language education.

This considered, I believe it is important now to recall my previous research on student expectations towards language education and the "Japanese for thinking" approach because of an aspect of the data I have collected in that previous occasion. In order to deepen my understanding of students' perspective on the course, in fact, I carried out interviews with some of them, which I had cautiously selected on basis of their attitude and reactions as well as their outcomes throughout the course, as I carried out participant observation (Alessandrini, 2019; 2020). Among them, student A., who had formed an overall negative opinion of the activity, spontaneously admitted, as he/she was recalling and discussing his/her experience throughout the interview with me (Italian to English, my translation):

> Talking to you, as you have a clear idea of Hosokawa's work, and you have carried out this project as well… (This) would help me come up with more ideas. (Interview with student A. from the "Identifying my research theme" course, academic year 2017-18; May 5th, 2018)

Such acknowledgment on his/her side points out the possibility for students to gain a different awareness of their involvement in the activity, if they happen to confer about it together with a more experienced participant. Indeed, the "Identifying my research theme" course did not define nor involve such possibility, as facilitators weren't expected to be involved in the activity.

A year later, having had the opportunity to participate as 'peer-facilitator' to the aforementioned JFL course, also inspired to the approach of "Japanese for thinking", I started questioning if the presence of 'facilitators' could therefore help students mitigate their "uneasiness" caused by such concept. Contrary to what I had previously assumed, not only it was still underlying, but it was also directed elsewhere: this time, I was still able to observe students experiencing "uneasiness" but towards me, because of my presence as a 'facilitator'. What had happened? What kind of expectations did students have towards 'facilitators'?

Literature review: Understanding the facilitator in language education

At Ca' Foscari University of Venice, dialogic language education approach-based courses have been ideated and carried out by professor Marcella Mariotti from as early as 2010: drawing on the idea of fostering social cohesion and mutual understanding through foreign language learning and teaching (Council of Europe 2001), such courses aim at creating a place for citizenship education through active learning classes (Hosokawa, Ōtsuji & Mariotti, 2016). Participants are invited to consider and engage in dialogue together about a theme of their choice, eventually questioning their own values and thus becoming more aware of underlying ideologies through critical thinking and communication in a foreign language.

Considered the uniqueness of this course among language teaching and learning practices, an overview of facilitators conceptualization as actors inside the classroom is contemplated as necessary. Being a fundamental component of this activity, dialogue permeates every aspect of this activity: it is through dialogue that participants form and express what they are thinking and state their opinion to others; it is through dialogue that they have the chance to broaden and transform their view in confronting with each other; it is through dialogue that they discuss and decide criteria for personal and mutual evaluation. Thus, given their role of active participants in the educational activity, 'facilitators' in these course are subjects engaging in such dialogical exchange together with students; moreover, they are introduced by the teacher to them as such, and they usually consist in a group of peers to the students, not necessarily in terms of age and belonging to the same affiliation.

Until now, I have been keeping the term 'facilitator' between single quotation marks in an attempt to refer specifically to the figure involved in this approach, thus differentiating it from the more wide-spread notion of facilitator in language education; this is due not only to the novelty of its conceptualization, but also to the blurred outline surrounding its definition inside the language learning and teaching landscape. In fact, whereas it is apparent that the concept of 'facilitation' does exist inside the language classroom, it is also often associated with the teacher; moreover, producing a definition *per se* appears to be a much complex process, as it is often presented as an attribute, a change in condition of the teacher rather than a standalone participant.

In recent times, learner-centered approaches have become a mainstay in language education practices, entailing a re-definition of the teacher from a figure dispensing knowledge to a "guide on the side" (Morrison, 2014) who can mentor the student through the learning experience. The shift entails a more well-balanced relationship among the two participants, with the teacher not positioning as an informant of knowledge and instructions, but taking a step back so that the student becomes in charge of his/her own involvement in learning; this would grant learners with the opportunity to develop more autonomy as well as responsibility towards their learning process and achievements, thus fostering motivation (Umeda, 2005; Balboni, 2014; Caon, 2017). However, the teacher, now facilitator, does not disappear from the picture, rather developing into a promoter of communication (Antón, 1999, p. 303), mediating among learners and, in this case, language learning (Balboni, 2014, p. 4). Grasha (1994, p. 143a) defines being a facilitator as a "teaching style", focused on

fostering learners' "capacity for independent action and responsibility. [The facilitator] works with students in a consultative fashion and provides much support and encouragement". Such explorative approach adopted by teachers as facilitators turns their guiding feature into an appropriate description for their actions; nevertheless, Grasha (1994, p. 143b) also points out how it could "make students uncomfortable if it's not used in a positive and affirming manner".

As Nunan indicates, the learner-centered approach is well implemented in language education under the light of communicative language teaching, first-hand promoted by the Council of Europe and involving the idea of learners "develop[ing] the ability to use language to get things done" (2013, p. 31a), thus highlighting their purpose and motivation behind their utterances; this way, students' "wider experience of life" (2013, p. 31b) can be brought into perspective and relate to their language learning and educational process. However, while this involves a shift of focus from grammatical correctness to learners' life outside the classroom, teachers are still vastly "incorporating elements of structural practice and grammar teaching in their classroom" (Nunan, 2013, p. 32). This confirms to be a major difference between the characteristics of the facilitator in language education and the approach considered in this study, which I will explore in deep by introducing the case study for this research.

Case study: Giving meaning to the 'facilitator'

As anticipated in the introduction, the course considered as a case-study for this research was held during the second semester of the academic year 2018-19 at Ca' Foscari University of Venice; by professor Marcella Mariotti (Ca' Foscari University of Venice, Italy), it was aimed at third year bachelor's degree students in Japanese studies, thus configuring as a JFL course.

Titled "My future", on the more practical side the course entailed writing a report in Japanese language, through which students would focus on their personal dreams and goals; to do so, they would engage in dialogue with peers and the teacher inside the classroom, and with an external interlocutor of their choice, thus developing critical thinking skills and critical awareness about their projects for the future throughout the process. Moreover, students would have been in charge of presenting their finished work to the class, before proceeding to both self- and reciprocal evaluation based on the criteria decided through respectful and pondered discussion on the activity. The course consisted of 15 classes of 90 minutes each; while over 60 students have been attending the earliest classes, only 48 managed to complete the course until the very end.

As the number of the students wouldn't allow proper individual engagement, they were asked to organize themselves, after consultation with each other, in 11 different groups divided by 'theme' of their reports (e.g. shared goal or dream for the future; similar occupational perspective): each group was made up of an average of 4 students, as well as one facilitator. Among facilitators (13 of them in total), 10 of them were of Italian background, while it was Japanese for the remaining 3; moreover, 9 of them had already had previous experience of "Japanese for thinking" theory or approach, and 7 facilitators had participated to the course as they were directly interested in (Japanese) language education; finally, 6 facilitators were interns of the project "NoLBrick - No Level-Brick Language Learning: Transformative Language

Education" - SPIN (Supporting Principal INvestigator), conducted by prof. Marcella Mariotti and funded by Ca' Foscari University of Venice.

In this context, dialogue proves to be the driving force of the course, as it provides learners (and participants as a whole, hence they are also involved in the thinking process) with the opportunity to confront themselves with perspectives other than their own, negotiating meaning in foreign language to express their opinion and confronting with other, thus aiming to citizenship formation. The process of language learning does not remain self-referential inside the pages of a textbook, nor does require practices for their own sake, as the students are engaged and encourage in concrete communication about a topic they care for; while it *does* support students in consolidating their foreign language competence through continuous interaction, the presence of facilitators goes far beyond simply guiding students regarding how to navigate as they approach a topic they don't know:

> The role of the facilitators was to promote critical thinking and help them (the students) orientate and focalize their thoughts. They ought to imply the *maieutic* method to stimulate students to question themselves and explore the target language. (Ligabue, 2019, p. 7a)

As described above Ligabue, who has participated in the aforementioned course as a facilitator himself, highlights the "maieutic" process as the prominent feature in the intervention of facilitators, conjoined with the opportunity to explore a foreign language through the student quest in expressing their thoughts. However, he also stresses their relevance as a figure *in-between* students and the teacher:

> […] the facilitator can be defined as *a mediator who tries to fill the gap between the frightening character of the professor and the shyness of the student*; someone who does not question students but *helps them when they do not know what critical questions they should ask themselves*. (Ligabue, 2019, p. 7b)

By name in this context, the facilitator is neither a student, nor the teacher; and, if any apprehension in having to engage with the teacher may be in action, disrupting students' effort in the dialogue, connecting with a figure considered other than the latter would ease students to open up. Thus, potentially even being the same age or still students and colleagues of the learners, peer-facilitators foster motivation so that students can focus on communicating with each other, hence creating ideal conditions for students' affective filter reduction (Caddeo, Ligabue, Mariko, Nishida 2019) and facilitating language acquisition (Krashen, p. 1982).

Complying by such interpretation, the dynamics intertwined between facilitators and students as participants to the course here considered as a case study should ideally contribute in stemming student uneasiness caused by its approach: this because learners find themselves in the condition to create a meaningful relationship with facilitators, and confer with them about aspects of the activity causing concern. Looking into its specific instances involving facilitators, such as the beginners-aimed course held at Ca' Foscari University of Venice in 2016 (Mariotti & Ichishima 2017; Arleoni 2017), peer-facilitators (here referred to as "tutor") were ultimately described as "a guide, a support and a source of motivation" (Arleoni 2017, p. 71; Italian to English, my translation). If we consider the positive impact registered in these

experiences, how can "uneasiness" manifested towards facilitators throughout the course and here considered as a case study be interpreted?

Study design and findings: Relating to the facilitator

In order to pursue this research, I have taken advantage of my experience as a facilitator in the course, which constitutes a qualitative case study (Duff 2012), and I have carried out participant observation in class throughout all the scheduled activities; the data I have personally collected consists in field notes as well as audio recordings. Since I was myself a member of only one group, recordings are mainly (as they also include interactions between the teacher talking to the class as a whole) restricted to the events happened among its participants; in detail, my group was made up by 2 facilitators (1 of Italian background, 1 of Japanese background) and 5 students (all of them of Italian background).

I have also drawn upon an online database, consisting in the student reports handed in for evaluation, their discussion threads on the online platform employed to provide long-distance interaction other than inside the classroom, as well as their impressions related to one class where they were purposely separated from their respective facilitator. Finally, I have examined 12 facilitator reports, consisting of their considerations and depiction of their experience as such; inquired by professor Mariotti herself, the report consisted of a series of questions, part of which was formulated on the basis of Arleoni (2017).

Findings 1: The facilitator as a figure who provides validation

Although indirectly, some students (14 out of 44) have pointed out a connection between their relationship with the facilitator and the need for validation. It is possible to assume that these students have interpreted the presence of the facilitator as a 'regulator' of their interactions, thus overlooking the possibility of learning from him/her. For example, guidance in fostering communication among the participants has been misunderstood as a behavior characteristic of the facilitator only (Japanese to English, my translation):

> When the facilitator helps us, he/she *makes sure* everyone is talking and that we state our opinion. […] As he/she wasn't present (today), I feel like this class has been *unfruitful*.
> (Student B.'s comment on April 1st, 2019 class without facilitators; emphasis added by the author)

Validation can be conceived as a positive emotion. However, in cases such as this, it can be argued that students were looking up to the facilitators in order to receive confirmation; relying heavily on facilitator approval, this student has expressed confusion when he/she had to face the activity alone, lacking understanding in why the facilitator had been taken away from the group. Moreover, it is important here to highlight the fact that this student didn't express to have missed the facilitator and his/her individuality as a member of the group, but he/she simply stated regret due to his/her absence. Thus, the facilitator is here seen in a merely instrumental perspective, as someone who has a very precise role: regulating student interactions and leading the development of the group. As these characteristics are believed not to be shared or

acquired by the students, the facilitator being absent from the group results in impressions of unproductiveness.

Findings 2: The facilitator as a figure of authority

A minority of students (3 out of 44) demonstrated to have developed an even more stiffened relationship with their facilitator, reinforcing its conceptualization as a regulator in "authority": in these circumstances, students would experience uneasiness not only in interacting with their facilitator, but also with other teammates, as they expected their actions and achievements to be judged positively or negatively. Until now, the presence of the facilitator inside the group has been argued as beneficial because it helps to bridge the gap between students and teacher, thus mediating learners direct confrontation with the figure in charge for the educational activity; however, students relating to facilitators in terms of an "authority" experienced the idea of being 'tested' by them (Italian to English, my translation):

> I perceive our facilitators as an *authority*, so *I feel like I need to maintain a certain level of Japanese proficiency (when I talk) with them*. […] However, I still feel like they are needed to manage the activity and discussion.(Student C.'s comment on April 1st, 2019 class without facilitators; emphasis added by the author)

In this case, the peer-like relationship between student and facilitator is subverted and turned into subordination to the facilitator, to the point of experiencing the same difficulties in communication that could have arouse between students and the teacher, because of learner apprehension of being judged in their abilities and performance. Regardless of facilitators' proficiency in the target language, this student still experienced uneasiness due to his/her thematization of the facilitator as a 'mini-teacher', and possibly, a referee of the main teacher in the course; this would explain the difficulties experienced in relating with him/her.

The majority of students (3 out of 4; 1 unknown) in my group have shown similar hardships in creating a meaningful relationship with their facilitators, due to their perception of my role as their teammate. Communicating or answering questions in the target language posed by the facilitator proved to be a major obstacle for students experiencing little self-confidence in their abilities; especially when engaging in dialogue with me, being a facilitator with the same background as them, students wouldn't put much effort in addressing or replying to me in Japanese, but would rather switch to our shared native language: this as an attempt of avoiding the possibility of being challenged or judged due to their proficiency in target language.

Still, they also confirmed to perceive the facilitator as a figure who gives orders and makes decisions inside the group: in fact, students would engage with me as a substitute of the teacher, reaching out for me whenever they needed clarification and asking me for confirmation about both major and minor aspects of class activity, thus taking for granted that I could provide better 'understanding' of what was happening in the course and thus relying on me as an 'instructor' rather than a facilitator. In these terms, my presence turned into a restriction of students' responsibility of thinking for themselves and giving their own interpretation of the course.

Findings 3: Students' quest for autonomy

In their comments relating to experiencing the course by themselves, some students (13 out of 44) showed having implicitly questioned their reliance on the facilitator. Once again, what emerges here is a contextualization of the facilitator as a regulator, if not a leader of group activities:

> Last week, we carried out the activity without our facilitator. *I started thinking freely.* [...] Facilitators may not know the aim of the course 100%, but their questions really help. Therefore, if facilitators won't be with us anymore from now on, *we have to start to carry out the activity as they do*. (Student D.'s comment on April 1st, 2019 class without facilitators; emphasis added by the author)

In the above comment, a student inadvertently realizes not to have been able to fully take his responsibility as a member of the group into his own hands until then due to the presence of the facilitator; but, he/she was able to develop such awareness of his/her situation only in the moment where he/she found him/herself alone with other students (who are, again, here considered as the sole peers, contrary to the facilitator). The reliance on the facilitator here is consolidated to the point that this student has realized his active role inside the group (i.e. the opportunity of elaborating his perspective with others through dialogue; the ability of deciding for himself and discussing possibilities with teammates) as he/she had to face the activity by him/herself.

Lack of autonomy determined by the presence of facilitators has been found also in students who have claimed having created a very positive relationship with them. Although declaring of considering the facilitator as a teammate, there is a discrepancy in its depiction compared to peer-students, as the facilitator is considered a guide rather than a peer (Italian to English, my translation):

> [...] we have missed each other, because we have experienced *the absence of a guide* and because we consider them part of our group. On a side, this class could have been *an opportunity to develop our own autonomy*, but I could see how some members of my group were feeling lost, *as if they couldn't understand the significance of the absence of facilitators*.
> (Student D.'s comment on April 1st, 2019 class without facilitators; emphasis added by the author)

While this student criticized the behavior of his/her peers, deeming it as passive, he/she also admitted his/her group dependence on the facilitator, who is here described as a "guide". Thus, despite the alternance in relationship dynamics, students prove to struggle in managing themselves on their own, and they turn to the facilitator as a figure other than students, who are seen as the 'pillar' of the activity.

Findings 4: Facilitators' perception of themselves

Finally, when asked about their understanding of their presence as participants to the activity, the majority of facilitators (9 out of 12; 1 unknown) legitimated it with the assumption that students would find themselves more at ease when interacting with peers rather than with the teachers. In this case, we can find alignment between

facilitators' perception of themselves and the concept of facilitators as useful to the course in order to engage with the students (Italian to English, my translation):

> As a facilitator, I could experience *how students prefer interacting with someone who is on a 'peer-level'* instead than with the teacher.(Facilitator A.'s final report, handed in on May 5th, 2019; emphasis added by the author)

However, this statement proves to be in contradiction with students' admitted perception of the facilitators inside their groups, as the latter was ultimately contextualized as closer to a guide, and therefore to a teacher figure, rather than to a peer-student. Misalignment between such impression and students' has also to be found in students' reaction to facilitators being excluded from the evaluation process; in this case, one of the facilitators could perceive students' confusion and dissatisfaction in witnessing facilitators not taking active role in this part of the activity (Japanese to Italian, my translation):

> As a facilitator, I haven't participated in the discussion about the evaluation criteria. As I wasn't expressing my opinion about it, student F. told me: "*This is not fair*. You are a student too, so please say something".(Facilitator B.'s final report, handed in on May 7th, 2019; emphasis added by the author)

In this case, facilitator non-participation to the evaluation process resulted in an obstacle in creating a balance between them and students, as it accentuated or gave shape to the idea of facilitators as 'external' participants, who aren't as fully involved in the course as students. As it affects students' material achievement in their degree course as marks, being excluded from receiving judgement is believed to have contributed to creating a power relationship between students and facilitators.

Discussion: Socially positioning the 'peer-facilitator'

Reviewing previous literature related to general and language education, it was possible to observe how it converges on a thematization of the facilitator as a guide, a director and a support to the student in order to navigate responsibly and autonomously and pave their own, individual way through the object of learning (Morrison, 2014; Caon, 2017; Arleoni, 2017); mediation in these terms brings on fulfilment and satisfaction for the student in pursuing their learning achievement (Umeda, 2005; Balboni, 2014). As these same conditions applied, based on the findings considered in this research I believe it is safe to say that the facilitators for the course above considered as a case study successfully managed to mediate students' expectations towards this activity; proving to be relatable as a guide, the facilitator bolsters learner adjustment to the novelty of the course approach, mitigating its induced uneasiness (Hosokawa & Kabaya eds., 2008).

This is as far as uneasiness towards the activity is concerned; however, the same cannot be said in the case of the expectations towards facilitators. Despite being a peer, the facilitator is still subject to the scrutiny of the students, as he/she provides a channel for them to seek for validation inside the learning environment, much like the teacher. Thus, while the relationship gap between students and teachers can be potentially be bridged by the involvement of facilitators, consistent disparity among student perception and assumptions on facilitators and vice versa impacts negatively

on the interpersonal relationships among participants, as well as on the framework and aims of the course.

It is not the inherent presence of peer-facilitators inducing tension and uneasiness in the students; as showed in the findings, only some among the learners have related to their facilitators as figure of marked authority, potentially disrupting the equilibrium inside the group, while the majority had still managed to positively connect with their facilitator. In fact, I would like to state that the rift among students and peer-facilitators has to be found in the way they are socially positioned by learners into the learning activity. By envisioning the students as a guide and relying on them in this sense, students haven't developed awareness of the facilitator as a participant, but as a substitute of the teacher; the consequences echo on the development of the course, as they are unable to fully fulfil their autonomy and responsibility in thinking for themselves.

The student-facilitators gap is sustained by self-perceived inadequacy of the students in their target language abilities (Alessandrini, 2020), which causes them not only to rely on facilitators as considered as more proficient, but also to experience tension as they believe to be evaluated negatively by a figure in power related to the teacher. In this perspective, students feel inadequate to engage with others in interactions, even though testing foreign language abilities is not included among the aims of the course. Furthermore, partial involvement in the course (i.e. not participating in the report writing or evaluation process) by the facilitators greatly weighs on students' perception of them as participants, as it contributes to the abridgement of identity questioning on both sides. The first entailing the development and statement of their personal opinion, and the second expressing judgment over it, the two activities prove to be two crucial in the formation of emotional connection among participants, which fails to arise in the moment only one side is involved. Thus, students and facilitators eventually believe to be unevenly positioned inside the learning environment, although the course approach has attempted to place them in an egalitarian relationship.

Conclusion: Unavoidable gap?

As mutual involvement has proven to be crucial in creating the conditions so that students and facilitators can relate to each other on an emotional level, practical suggestions on the organization and execution of such dialogical language education for the future regard the involvement of all participants in all the activities of the course. This considered, my hope is for the results of this research to contribute in calling into question the 'guiding' figure in language education, as a presence who is supposed to be on the side of the student, but which doesn't necessarily succeed on establishing a meaningful relationship on a pedagogical perspective.

While the switch from teacher to facilitator, and from teacher-centered to learner-centered approach has been successful, I believe a further shift to be required for non-discriminating, boundary-crossing language education to flourish. Defining facilitators as they are introduced to the students may constitute a problem itself, as it adds a new, unknown figure in the learning environment, a previously external presence who eventually ends up being framed in a role that is other than the students; who can become an ally to them, but still isn't recognized as a peer, because it is

positioned by learners as a member of a hierarchical teaching and learning system, which still presents the teacher and 'guides' on its upper level, and students on the bottom.

As a former student and a facilitator for this course myself, I walked in the classroom and met the students with the best intentions: I truly wanted to be of some help to them, to sit in class and make use of the precious time we shared in order to think together about what is the most meaningful to us, to meet our views and laying the foundation for respectful dialogue; however, both the students and I struggled in getting over our established roles in the learning environment. Seemingly unavoidable in the present time, I believe the gap between students and facilitators can go through relevant changes if we decide to focus on the promotion of democracy and citizenship formation as the purpose of language education, as suggested by the principles of important language policies in the world (Council of Europe, 2001), dismantling the principle of language proficiency levels-based activities as suggested by the instance of language education researched in this study: becoming progressively aware of the boundaries underlying our learning system, and walking together towards more inclusive, critical language pedagogy.

Acknowledgments

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Innovations in Hospitality and Tourism Education in Vietnam: A Hypothetical Framework

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Abstract

Research Background: In Vietnam, the number of international tourists is increasing, and their needs become more diverse. However, workers in the hospitality and tourism industry do not meet the demands due to a lack of professional skills. Supporting teachers to innovate in teaching and curriculum development thus becomes vital for hospitality and tourism institutions to tackle this skill shortage issue. Nevertheless, scant research focused on factors responsible for educational innovations, particularly in hospitality and tourism education. *Research Purpose*: This paper aims to propose a hypothetical framework for innovations in hospitality and tourism education using the concept of "professional capital" introduced by Hargreaves and Fullan (2012) and the curriculum renewal process by Van Brouwershaven (2018). *Research Methodology*: We adopted a mixed-method approach to address psychological factors, organizational conditions, and macro-environmental factors that influence how teachers foster pedagogical innovations. Qualitative methods include interviewing school administrators and teachers, and documentation which is the researchers' diaries. An online survey is also conducted with 94 teachers in Vietnam to identify factors responsible for innovations in hospitality and tourism education. *Results and Conclusions*: The hypothetical framework for innovations in hospitality and tourism education shows the relationships of three groups of factors, namely teachers' motivational forces, organizational supporting conditions, and macro-environmental factors. Although it needs to be tested in further studies, the suggested framework will help administrators of Vietnamese hospitality and tourism institutions build a motivational strategy to drive teachers' innovative behavior. It will also give directions for developing a training program that provides methods for teachers to initiate and implement innovations.

Keywords: Professional capital, Hospitality and tourism education, Teacher innovative behavior, Organizational innovation climate, Teacher intrinsic motivation, Curriculum renewal

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Background

Hospitality and tourism are among the fast-growing service industries that generate income and jobs worldwide. The substantial growth of this industry is bringing many financial and employment advantages to various emerging countries, of which Vietnam is an example. In 2018, according to the Vietnam National Administration of Tourism (2019), total international tourist arrivals to Vietnam reached over 15 million, increasing 19.9% over the same period in 2017. The country is also estimated to serve 80 million domestic travelers, generating more than 26 billion USD in tourism revenue.

The significant growth of the hospitality and tourism sector in Vietnam is, however, accompanied by the deficiency of skilled labor. There is an annual increase of 40,000 jobs created by this industry nationwide, yet educational institutions only respond to 37.5 percent of this demand (Maclean, Jagannathan, & Panth, 2018). Moreover, recent studies claim that students who graduate from educational institutions in Vietnam are not sufficiently equipped with essential capabilities to perform successfully at the workplace. In other words, the current education system in Vietnam does not adequately provide hospitality and tourism-related skill set for graduates to work in the industry, especially in the international business context (Le, 2017; Le, Klieve, & McDonald, 2018; Losekoot, Lastern, & Tran, 2019). The current labor market needs towards human resources are urging institutions to focus more on improving educational quality. Factors such as globalization, digitization, and the emergence of platform-based business models in the hospitality and tourism industry also make innovations in teaching and learning vital to high-performing educational institutions (Oskam, 2018). Subsequently, Vietnamese institutions need to adopt more innovative approaches in designing educational curriculum and pedagogical practices. Nonetheless, scant research has been done to identify factors responsible for teachers' innovation in pedagogical practices, particularly in the hospitality and tourism education. The purpose of this study is to propose a hypothetical framework for underlying factors that are responsible for innovations in hospitality and tourism education in the Vietnamese context.

Literature review

Definitions and importance of educational innovations

Esteemed authors have attempted to construct definitions for innovation. For example, Machiba (2010) refers to innovation as "the overarching concept that provides direction and vision for pursuing the overall societal changes needed to achieve sustainable development". Innovation is also characterized as the purposed invention, initiation, and implementation of original ideas within a professional group or organization to bring advantages to the group or the organization (Klaeijsen, Vermeulen, & Martens, 2018). From the perspective of knowledge science, Nakamori (2020) asserts that innovation can be represented by a triad showing three different types of knowledge: rational knowledge, intuitive knowledge, and social knowledge. This author also believes that business managers who adopt the knowledge triad to create innovations will be able to achieve strategic goals. In a more specific context, Jayawardena (2019), who chaired the four academic conferences on hospitality and tourism management in 2017 and 2018, attempted to capture the redefinition of

"innovation" by conference delegates. This author concludes that "innovation is the art of implementing new ideas to improve productivity, products, and services while enhancing customer satisfaction, revenues, and profitability." This definition has been analyzed and summarized from 13 latest papers on innovation in tourism from 17 different countries. Its emphasis is on the relevance of innovation to all macro- and micro-level perspectives of the hospitality and tourism industry. Noticeably, this author, Jayawardena (2019), also mentions the needs to have innovations in hospitality pedagogy and how these needs are responded by the government of the United Arab Emirates to foster a culture of change not only in hospitality and tourism industry but also in the whole country.

Most studies refer to innovation as a significant resource for human beings. In the educational field, for example, changes and innovations are a clear priority in reputable institutions worldwide (European Commission, 2010; Hargreaves, Lieberman, Fullan, & Hopkins, 2010; Law, Yuen, & Fox, 2011; Levin, 2008). As a result, in recent years, researchers have focused more on defining and evaluating educational innovations. For instance, Foray and Raffo (2012) refer to educational innovations as new tools, practices, technologies, or systems that are developed and shared to improve educational quality. In a more general way, educational innovations can be defined as the whole process of developing and implementing new ideas in the educational environment. Such purposes need to be formed through collaboration and accumulation to effectively respond to the environmental changes which institutions are confronting nowadays (Leadbeater, 2012).

Nevertheless, numerous researchers also raise the concerns that defining innovations merely is not sufficient. The value of educational innovations must be determined by whether such innovations are feasible and thus could be implemented successfully. For example, Díaz-Gibson, Civís, Fontanet, López, and Prats (2019) insists that while educational innovations may be new, it is not equivalent to success or effectiveness. Reid and Baker (2018) add that developing educational innovations requires a methodological approach in which educational gaps have to be diagnosed. Moreover, the process of evaluating the effectiveness of such innovations in filling the gaps needs to take place.

In the field of hospitality education, the importance of innovation is emphasized by Oskam (2018), who argues that globalization, digitization and the development of platform-based business models require educational institutions to be at a higher degree of readiness in designing long term strategies that are contrary to the traditional pedagogical approaches. Airey and Tribe (2000) also emphasize that only by creating new ideas and knowledge for better solutions, hospitality education can "refresh itself and maintain its relevance, whether for the world of work or beyond". That is to say, the hospitality and tourism profession has developed in such a way that a single approach, for example, a vocational approach to skills and techniques, to construct educational curriculum is no longer sufficient. The increased complexity in the environment has urged institutions to seek systematic and innovative methods to ensure that education is responding to the worldwide operations of the industry, the advances in technology and the changes in consumers' expectations (Oskam, Chapter 15: Conclusion: The Future of Hospitality Education, 2018). Similarly, Nadkarni and Morris (2019) refer to the specific context of Dubai, a country known for its fast-growing hospitality and tourism, to highlight that the sustainable development of this

industry depends on the human capital, which requires not only the education process itself to be more innovative, but also the support from the macro-level aspects. Accordingly, the United Arab Emirates (UAE) Ministry of Education (MoE) collaborated with Standford University to launch the three-year UAE Standford Innovation and Entrepreneurship Educational Initiative (Ministry of Education, UAE, 2016), in which teaching staff from UAE received training from Standford University to construct and implement courses on innovation and entrepreneurship at their institutions. In brief, it is evident that exploring educational innovations and finding factors fostering such innovations in the digital era of hospitality and tourism education is significantly essential in many different areas of the world.

Motivational forces that influence teachers' innovations in hospitality and tourism education

When referring to the motivations that drive teachers to create innovations in their teaching practices, Hargreaves and Fullan (2012) introduce the concept of "Professional Capital", in which there are three components supporting teachers and institutions' innovation. These components, titled Human Capital, Social Capital, and Decisional Capital, provide a useful structure to identify factors that encourage pedagogical innovations. Holdsworth and Maynes (2017) have adopted this "Professional Capital" framework to build better insights into how teachers and institutions initiate and implement innovation. Such ideas were listed as nine emergent themes influencing teachers' innovations and connecting to the three components of the framework. These themes include "teacher attitude and beliefs, teacher emotions, student engagement, the role of collaboration, school structure, relational trust, professional learning, the perception of support, and school leadership". However, since the qualitative study by Holdsworth and Maynes (2017) based mainly on case studies and small samples, it thus could not be generalized to other contexts. It is also worth noticing that esteemed authors such as Hargreaves and Fullan (2012) attempt to identify factors that drive teachers' innovations in a general context. More studies are needed to extend the work of these authors by combining both quantitative and qualitative research in identifying conditions that support teachers' innovativeness in a specific field such as hospitality and tourism education.

In addition to innovations in pedagogical practices in hospitality and tourism education, it is also necessary for educators to focus on factors influencing curriculum renewal. Van Brouwershaven (2018) states that the board of directors, management, and other stakeholders need to facilitate the process of curriculum renewal to achieve the benefits of educational quality and school competitiveness. Therefore, it is vital to identify factors that are responsible for such a process. Van Brouwershaven (2018) and Viglia, Pelloia, and Buhalis (2018) have attempted to explore these factors and found that educational facilities, school stakeholders, ICT changes in the industry, and education alignment, which is defined as the process of delivering educational programs and the management functions, are critical elements for curriculum to be developed. Although the study by van Brouwershaven (2018) provides a detailed framework for educational alignment in curriculum renewal to guide educational organizations towards better quality, it did not suggest scoring rubrics for using this framework to serve quality assurance purposes. Moreover, the study had limitations as it based mostly on the author's personal experiences gained through the Bachelor curriculum renewal project at Hotelschool the Hague in 2015.

Besides the most recent study by Van Brouwershaven (2018), other studies also focus on curriculum renewal for hospitality and tourism education. For example, by introducing theoretical means to foster curricular innovation, Munar and Bødker (2015) highlight the need to pursue a curriculum expansion because of the present advanced technology and industry evolution. These authors believe that the future of tourism education depends on the diversity of interdisciplinary approaches that researchers in the field will adopt to propose the continuous renewal of the educational curriculum for hospitality and tourism education. Similarly, Millar and Park (2013) also imply in their study on the sustainability of the hospitality and tourism industry, stating that the hospitality curriculum should always be updated and progressive to engage students and equip them with the necessary competence to succeed in their careers in the industry. Last but not least, Catrett (2018) highlights that while attempting to initiate curriculum innovations to meet industry requirements, most European hotel schools did not abandon their existing vocational or practical orientations. In fact, they have evolved a hybrid model of business and technical education. For example, The Hague or Vatel began to incorporate a significant portion of management education in their current curricula despite being criticized by other European practice-based technical-training institutions for no longer being a genuine hotel school.

Despite numerous definitions established for innovation in various fields and the increasing concerns in the needs to have educational innovations, very few researches focused on innovations in terms of pedagogical practices and curriculum development, especially for the hospitality and tourism industry. We need more research to identify factors that are responsible for innovation in education of this fast-growing industry. Also, since these factors are challenging to measure quantitatively, research on this discipline was based merely on the qualitative approach. Therefore, combinations of both qualitative and quantitative research methodology are needed to have more comprehensive studies on this topic.

Educational innovations in Vietnamese hospitality and tourism education

Vietnam is among the Association of Southeast Asian Nations (ASEAN), where tourism is an essential source of foreign exchange income and employment opportunities (Rawat, Bouchon, & Nair, 2015). Hampton, Jeyacheya, and Pham (2018) report that the tourism industry contributed a total of around 9.3 percent of Vietnam's GDP in 2014 and thus has become a national strategic industry. In 2018, total international tourist arrivals to Vietnam reached over 15 million, increasing 19.9% over the same period in 2017. The country is also estimated to serve 80 million domestic travelers, generating more than 26 billion USD in tourism revenue (Vietnam National Administration of Tourism, 2019).

According to Buzinde et al. (2018), although Vietnam is the fastest growing economy in Southeast Asia and "an increasingly formidable player in the regional tourism arena", the country is still struggling to address its workforce issues. Many esteemed authors explain that the current education system in Vietnam does not adequately equip graduates with sufficient skills and abilities to work successfully in the industry, especially in the international business context (Le, 2017; Le, Klieve, & McDonald, 2018; Losekoot, Lastern, & Tran, 2019). While analyzing the motivational forces that encourage Vietnamese students to enroll in tourism degrees, Buzinde et al. (2018)

suggest that students' motivation to join hospitality and tourism degrees appear to form a hierarchy with knowledge at the top. This study implies that to achieve student retention, educational institutions need to adopt pedagogical approaches that can effectively provide students with the necessary knowledge and skills to succeed in the industry. Another study by Tran and Nguyen (2018) also emphasizes that greater attention needs to be paid to engaging students in the field of hospitality and tourism. The authors claim that institutions need to seek innovative approaches such as work-integrated learning to improve the learning experience of students. Likewise, Le, Klieve, and McDonald (2018) believe that Vietnamese hospitality and tourism institutions lack effective responses to labor market needs. This deficiency is caused by insufficient policies to facilitate the partnership between enterprises and educational institutions towards constructing curricula and pedagogical approaches that meet industry requirements.

In brief, Vietnam appears to be an example of an ASEAN country where the fast-growing hospitality and tourism industry pose numerous labor challenges, among which lacking quality training and education services is evident (Hampton, Jeyacheya, & Pham, 2018). That is to say, educational institutions play an important role in building human capacity to address the labor challenges of a tourism-dependent nation like Vietnam. Institutions thus need to adopt more innovative approaches in which the linkage between education and industry is better strengthened. Accordingly, educational curriculum needs to be progressively updated to respond to the rapid environmental changes in the industry. Also, innovative pedagogical practices are required to engage and inspire students. These approaches are not only to retain these students but also to equip them with appropriate skills and attitudes needed to succeed in the workplace.

Moreover, it is worth noticing that developing any educational innovations requires the systematic and methodical processes to identify the educational gaps and verify whether the innovative practices fill in these gaps. To put it differently, Reid and Baker (2018) assert that successful educational innovations require "needs assessment, design and intervention, testing and analysis, evaluation of intervention, and determination of learning retention." Therefore, any studies focusing on constructing and implementing innovations for hospitality and tourism education in Vietnam need such approaches to validate the innovations' success in achieving educational goals. Nonetheless, there have been few researches which concentrate on building and testing innovations, especially for the hospitality and tourism education of an emerging country like Vietnam. We need more research on this discipline to guide teachers towards more effective pedagogical methodology and curriculum renewal to successfully address the existing workforce issues.

Research methods

A study was conducted to identify factors responsible for innovations in hospitality and tourism education in Vietnam. Accordingly, this paper attempts to answer the following questions:

> *RQ1:* How can innovations in hospitality and tourism education in Vietnam be defined and illustrated?

RQ2: Which psychological factors encourage Vietnamese teachers to initiate and implement innovations in hospitality and tourism education?
RQ3: Which organizational conditions support teachers' innovations in the hospitality and tourism institutions of Vietnam?
RQ4: Which factors in the macro-environment urge Vietnamese teachers to innovate in their teaching and developing the hospitality and tourism curriculum?

The study was carried out as a mixed-method research. The mixed approach was chosen because it allows the research problems to be investigated in depth. The qualitative methods include 20 semi-structured interviews and documentation, which is the researcher's diaries. The quantitative approach was also applied with 94 online surveys. Complementing the data in this way helps to explore the Vietnamese teachers' perceptions of educational innovations and factors responsible for such innovations.

Results

Characteristics of the participants

Qualitative data are obtained through 20 semi-structured interviews carried out with a representative sample of Vietnamese institutions' administrators and teachers in hospitality and tourism education. Seven of the 20 interviewees are principals, and vice principals participating in the interviews are administering the largest hospitality and tourism institutions in the South of Vietnam. Thirteen of them are teachers from four universities and vocational colleges in Vietnam, which specializes in delivering education and training programs in hospitality and tourism. Each interview lasted approximately 45 minutes. The interviews aimed to find out how each teacher defines and illustrates educational innovations and the extent to which the school administrators and the teachers value the importance of educational innovations. In addition, the interviews focused on which factors encourage teachers to initiate and implement innovations in their teaching. The school administrators were also asked if they consider having curriculum renewal and which factors are responsible for such development in the educational curriculum of the institutions.

Quantitative data are collected through an online survey, into which answers from the qualitative methods were incorporated. 94 teachers from different organizations and institutions in Vietnam participated in this online survey, which was open from December 26, 2019, to January 4, 2020. Besides demographic information, participants were requested to rate the importance of educational innovation to their institutions and the labor requirements in the industry. They were also asked to list some of the most recent innovations they have made in their teaching, and the factors which they think are significant in driving their innovativeness in education. In addition, participants were asked to rank the three groups of factors that influence their innovative teaching. These include: (1) the psychological factors, which comprise of their beliefs, attitudes, and self-efficacy; (2) the organizational conditions consisting of school structure, leadership, collaboration, and facilities; (3) the macro-environmental factors which refer to the technological changes in the industry, the labor requirements in the industry, the demographic forces of the country, and the

governmental support towards institutions. Table 1 shows a summary of the survey structure.

Section	Question groups	Details
1	Demographic and background	Gender, Age, Qualifications, Types of Workplace, Workplace Sectors, Teaching Experience
2	Rating the importance of educational innovation to the institutions and the labor requirements in the industry	A 4-point response scale from 1-not important at all to 4-very important
3	Select or list most recent innovations respondents have made in their teaching	Answers from the interviews were provided for respondents to select. Respondents can also add more answers.
4	Select or list factors which respondents think are significant in driving their innovativeness in education	Answers from the interviews were provided for respondents to select. Respondents can also add more answers.
5	Rank the three groups of factors that influence their innovative teaching	Three groups of factors for ranking: (1) the psychological factors, (2) the organizational conditions; (3) the macro-environmental factors

Table 1 Summary of the survey structure

The background of the survey participants is summarized in Table 2. The percentages of male and female participants are nearly similar with 51% for male and 49% for female. The participants were predominantly teachers from vocational colleges with (68.1%), followed by enterprises' trainers (22.3%), and 8.5% of participants are university lecturers, only one teacher works as a free-lance trainer. Survey respondents are also predominantly aged between 31 and 41 years (41.4%). Those aged from 41 to 50 years comprise a slightly lower percentage of the total (25.5%), teachers who are from 51 to 60 years old account for approximately 18.1%, while the youngest and the oldest group account for lowest percentages (around 6% each).

Regarding the highest qualifications of the teachers who participated in the online survey, the majority (52.1%) had a Bachelor's Degree working mostly at vocational colleges, followed by those with a Master's Degree (34%). While college graduates and those with other qualifications such as professional certification comprise 9.6% of the total, only 4.3% of participants obtained Doctor Degree, most of whom are teaching at universities.

The participants were predominantly teachers working in the vocational colleges in the public sector or owned by government-owned enterprises (64.9%). The second largest group accounts for 22.3% of participants. These people are trainers at three different types of enterprises, which include private, state-owned, and foreign-investment ones. Lecturers at universities comprise of the smallest percentages, with only 6.3% teaching at public universities and 2.1% at private higher institutions. This distribution attempts to represent the overall hospitality and tourism annual workforce, which are supplied by educational institutions in Vietnam. According to Luu (2016), the total annual workforce provided by educational institutions for the

hospitality and tourism industry in Vietnam is approximately 22,000 graduates, among whom only 8.1% are from universities, while vocational colleges contribute 92.3% of this annually created labor pool.

Regarding teaching experience, participants having 5 to 10-year experience in teaching comprise 39.4% of the total. Those with more experience (10 – 15 years) account for 26.6%, followed by the most senior teachers (more than 15-year teaching experience) with 17%, the smallest group is also those with the least teaching experience (less than one year) (3.2%).

		Types of Workplace				Total
		Vocational College	University	Enterprise	Others	
Gender	Male	31	4	12	1	48
	Female	33	4	9	0	46
Age	25-30	4	0	4	0	8
	31-40	30	4	5	0	39
	41-50	15	3	6	0	24
	51-60	11	1	4	1	17
	>60	4	0	2	0	6
Qualifications	College Graduate	7	0	0	0	7
	Bachelor	41	0	8	0	49
	Master	14	5	12	1	32
	Doctor	0	3	1	0	4
	Others	2	0	0	0	2
Workplace Sectors	Public	4	6	0	0	10
	Private	3	2	6	0	11
	State-owned Enterprise	57	0	6	0	63
	Foreign Investment	0	0	9	0	9
	Others	0	0	0	1	1
Teaching Experience	Under 1 Year	1	0	2	0	3
	1 Year - Less Than 5 Years	3	3	7	0	13
	5 Years - Less Than 10 Years	32	1	4	0	37
	10 Years - Less Than 15 Years	17	2	5	1	25
	More Than 15 Years	11	2	3	0	16
Total		**64**	**8**	**21**	**1**	**94**

Table 2 Background of 94 participants

The importance of educational innovations

Both qualitative and quantitative data reveal that all participants from different types of hospitality and tourism institutions in Vietnam agree that educational innovations are important not only to the success of the institutions but also to the current labor issues in this industry in Vietnam. Accordingly, 100% of participants agree that

educational innovations are essential to the development and competitiveness of institutions, with 78.7% selected the highest rating ("very important"). In addition, the majority (97.9%) are also aware of the significant role of educational innovations in solving the labor quality issues of the industry workforce. Table 2 summarizes these ratings as follows:

Definitions and examples of educational innovations

Qualitative data reveal that most participants have definitions that are similar to those in the existing literature. Participants refer to educational innovations as new tools, practices, technologies, or systems that are developed and shared to improve educational quality. Interviewees, who are school administrators, also define educational innovations as processes of developing and implementing new ideas in the educational environment. In addition, when asked whether they have recent innovations in their teaching, 73.4% of online survey respondents replied "yes". They listed group discussions (64.9%), educational games (62.8%), case studies (59.6%), role play (47.9%), Internet and online platform-based activities (27.7%), project-based learning (16%), guest speakers (panel talks) (7.4%), and social media (6.4%) as their most recent pedagogical initiatives. Also, 60.6% of survey participants revealed their eagerness at the highest level ("very eager") to apply new teaching methods or tools if these innovations are introduced and explained for them. These results show that most participants from all different age groups and types of institutions express their attempt to implement educational innovations and their willingness to try the new tools or methods if these are well defined and demonstrated to them.

Regarding curriculum development, when requested to give opinions on a hybrid model incorporating business management with vocational education, most participants in both the interview and the survey agreed that this incorporation is necessary for the educational curriculum to meet the requirements of the industry and the development of the institutions. Accordingly, 5 out of 6 school administrators agreed in the interview that Vietnamese institutions must combine both management education with vocational training in their curriculum to meet the typical requirements of the hospitality and tourism industry. Similarly, 80.9% of survey respondents claim that hospitality and tourism institutions need to integrate both the business management approach and technical training approach into the educational curriculum.

Factors responsible for teachers' innovations

Interview participants listed numerous factors that drive institutions towards curriculum renewal and teachers' pedagogical innovations. These factors can be grouped into three different categories: (1) teachers' psychological factors which were described as teachers' beliefs and attitudes, their self-efficacy, and how they internalize schools' goals into their personal goals; (2) organizational conditions which support and encourage teachers to initiate and implement pedagogical innovations, for example, school structure and leadership, relational trust, collaboration between colleagues, professional learning opportunities, and school facilities; and (3) macro-environmental factors which are responsible for what drive curriculum renewal. These macro-environmental factors include (i) information technological advances in the industry, (ii) industry needs and economic forces, (iii)

demographic forces, and (iv) governmental guidance and support towards curriculum design. When incorporated into the survey, these factors also received high percentages of agreement from respondents. Specifically, 67% of survey participants ranked teachers' psychological factors as the most critical influence on whether teachers initiate and implement their pedagogical innovations. This percentage for the group of organizational conditions is 30.9%, making these organizational elements the second essential group of factors responsible for educational innovations in hospitality and tourism institutions in Vietnam. Most participants rated macro-environmental factors as the third position in influencing the nurturing and implementing processes of educational innovations. However, in the interview, most school administrators emphasized that these macro-environmental factors are especially significant to the operation of curriculum renewal in these organizations.

Conclusion: **A hypothetical framework for innovations in hospitality and tourism education in Vietnam**

This paper aims to define and illustrate innovations in hospitality and tourism education in Vietnam. The study's primary goal is to propose a hypothetical framework for innovations in hospitality and tourism education using the concept of "professional capital" introduced by Hargreaves and Fullan (2012), and the curriculum renewal process by Van Brouwershaven (2018). Figure 1 reveals this hypothetical framework, which shows the theoretical relationships of three groups of factors, namely teachers' psychological forces, organizational supporting conditions, and macro-environmental factors.
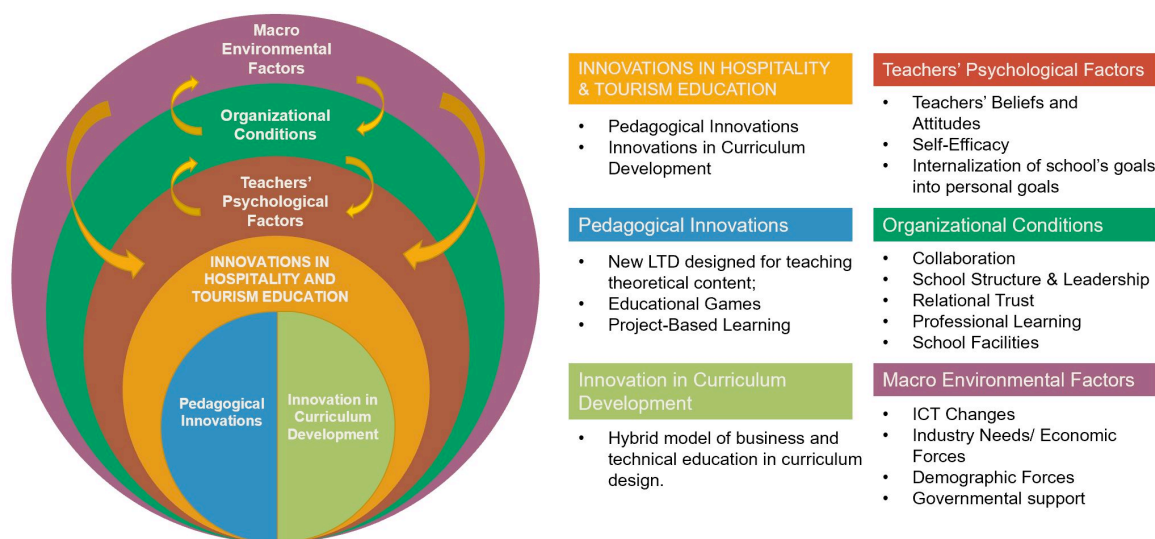
Figure 1: Hypothetical Framework for Innovations
in Hospitality and Tourism Education in Vietnam

According to this hypothetical framework, innovations in hospitality and tourism education can be defined as new tools, practices, technologies, or systems that are developed and shared to improve educational quality. Such innovations can be grouped into two main types: innovative pedagogical practices and curriculum innovations. Based on the interview and survey results, as well as the researcher's documentation and professional experience, the study proposes several illustrations for each of these types of innovations. For example, the pedagogical innovations to

help to teach more effectively include a new Learning-Through-Discussion method designed and customized for teaching theoretical content in the hospitality and tourism curriculum, educational games, and project-based learning. After these methods are designed, they will be evaluated through educational experiments to verify their effectiveness. The process of designing and conducting these experiments may contribute to the development of a training program that provides methods for teachers to initiate and implement pedagogical innovations. Similarly, an example of innovations in curriculum development is to build a hybrid model of business management and technical education in hospitality and tourism education. However, evaluating these curriculum innovations require more approaches rather than just educational experiments. There should be a mixed approach of both qualitative and quantitative methods to assess whether such hybrid models effectively meet the requirements of the institutions and the industry, and thus help address the labor issues in the hospitality and tourism industry in Vietnam.

To foster these educational innovations, the hypothetical framework suggests three groups of factors: (1) teachers' psychological factors which are described as teachers' beliefs and attitudes, their self-efficacy, and how they internalize schools' goals into their personal goals; (2) organizational conditions which support and encourage teachers to initiate and implement pedagogical innovations, for example, school structure and leadership, relational trust, collaboration between colleagues, professional learning opportunities, and school facilities; and (3) macro-environmental factors which are responsible for what drive curriculum renewal in hospitality and tourism institutions; these include (i) information technological advances in the industry, (ii) industry needs and economic forces, (iii) demographic forces, and (iv) governmental guidance and support towards curriculum design. A further research question is whether there are significant relationships among these psychological, organizational, and macro-environmental factors in fostering Vietnamese teachers' innovations in the field of hospitality and tourism education. Although these relationships need to be investigated and tested in our future studies, we believe the suggested framework will help administrators of Vietnamese hospitality and tourism institutions construct a motivational strategy to drive teachers' educational innovations. Such strategies start from assessing the extent to which the institutions are providing enough conditions for encouraging teachers to initiate and implement their innovations in teaching. While more research is being conducted to explore factors that are responsible for innovations in hospitality and tourism education in Vietnam, it would be reasonable for administrators and leaders in these institutions to pay more attention to their organizational conditions which can create the environment for teachers to innovate and improve their teaching.

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Teaching Experiences, Pedagogies, Practices and Praxes on the Subject of Applied Geo-Information System Technology

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Abstract

This paper has used teaching experiences from 2012 to 2019-based pedagogies and praxes on the subject of applied geo-information system technology (AGST) for graduate students on the Master of Science Program in Applied Information and Communication Technology, Faculty of Sciences and Liberal Arts, Rajamangala University of Technology ISAN, Thailand. The main purposes were to share teaching experiences with comparison of before-after studies on geo-information project-based learning which was evaluated by a number of thesis or independent study (IS). This research used purposive sampling with 14 graduate students who studied AGST during 2012-2019. The research tool was a before-after teaching plan and assessment. Based on the use of this teaching methodology it was found that of the14 graduate students during 2012-2019, 12 graduate students or 86% were able to use geo-information project-based learning to undertake their theses or ISs while the remaining 2 graduate students or 14% only acquired the knowledge although they did not use it on their theses or ISs. On the contrary, before-learning geo-information project, an evaluation was performed and 5 graduate students (35.71%), who were interested in doing thesis or IS on geo-information scored a total average of 80.19 points while the remaining 9 graduate students (64.29%), who were not interested scored a total average of 48.50 points. As a conclusion of the above mentioned over the eight years of teaching experience, approach of the active learning has showed a better performance as compared to the passive learning for undertaking theses and ISs.

Keywords: Teaching Experience, Geo-information project-based learning, Graduate Student

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Introduction

Applied geo-information system technology (AGST), is a subject for graduate students, which is part of the Master of Science Program in Applied Information and Communication Technology, Faculty of Sciences and Liberal Arts, Rajamangala University of Technology ISAN (RMUTI), Thailand. This subject is a part of Geography Education (GE) as a way to learn about Geospatial Technologies (GTs) and sophisticated software, etc. Consequently, lecturers and graduate students have to develop or improve and learn GTs. GE is related to the application of GTs and has a high commonality in twenty-first century education which is facing a tremendous impact and change with the advent of the Internet and Web GIS. In other words, GE-based GSTs have to face social networks enabled through the use of digital technologies such as mobile phones, the Internet etc. which may be called, "Digital Networks" (Khosrow-Pour, 2013) so GE should rethink its educational strategies within the digital networking arena. Furthermore, GE ideas related to the use and application are the process of geospatial practices (GPs) as the way to learn about GTs and by using GTs (Solari et al., 2015). GTs can be used to develop project-based learning pedagogies and help students to acquire spatial reasoning and spatial citizenship skills in the context of education for sustainable development (Gonzalez et al., 2019).

The main purposes were to share teaching experiences with comparison of before-after studies on geographic project-based learning which was evaluated by a number of theses or independent study (IS).

Methodology

The aim of AGST is to produce graduate students who will be able to learn and undertake their theses or ISs further. Therefore, this research used purposive sampling with 14 graduate students who studied AGST between 2012 and 2019. The research tool was a before-after teaching plan in geo-information project-based learning. The before-teaching plan (passive learning) was designed by the basic and theoretical learning of geo-information (such as Geographical Information System, GIS; Remote Sensing, RS; Global Position System, GPS, often referred to as, '3S') and an assessment of 14 graduate students from tests and questionnaires based on thesis or IS on application of geo-information. The after-teaching plan (active learning) was designed by geo-information project-based learning and assessment of 14 graduate students from a number of theses or IS. The before-after teaching in geo-information project-based learning was planned as follows:

1. The before-teaching plan (passive learning)

The before-teaching plan or passive learning was designed by the basic and theoretical learning of geo-information and was evaluated by tests and questionnaire on thesis or IS on application of geo-information. Details of the basic and theoretical learning of geo-information were determined as:

1.1 Concept knowledge as a foundation

Describing the role of GE-based GTs in this AGST subject in graduate students is not a simple task because they have varied background knowledge of geospatial information and its fundamentals. The AGST subject has been prepared by teaching the sequential topics: basic and theoretical approaches of geo-information including pre-and post-testing. Furthermore, the AGST teaching has used other geospatial teaching experiences such as those described by Ghaffari et al. (2018) and Moorman and Crichton (2018). Both research approaches were helpful in providing insights into the specific curriculum and pedagogical strategies that can help students overcome these challenges.

1.2 Geography and spatial thinking

Conceptualizing geospatial thinking can be considered as the first step forward in differentiating geography-unique spatial thinking from the spatial thinking practiced in other disciplines, such as medical sciences, engineering and architecture (Baker et al. 2015; Ishikawa 2013). An alternative opinion is that spatial thinking is not unlike other research-oriented approaches, it is merely different in terms of space (ESRI, 2003). Moreover, knowing where something is, how its location influences its characteristic, and how its location influences relationships with other phenomena are the foundations of geographic thinking. This mode of investigation asks graduate students to see the world, and all that is in it, in spatial terms. Consequently, graduate students who have had such course experiences, demonstrated a better understanding of geospatial patterns and transition, geospatial profiles and transition, geospatial associations, geospatial shapes and geospatial overlay. This is discussed by Verma and Estaville (2018). Furthermore, this AGST teaching methodology has used the approach of experiences of 'spatial thinking' from Collins (2018), Flynn (2018), Metoyer and Bednarz (2017).

2. The after-teaching plan (active learning)

In pedagogy and praxis, this assignment would be given to graduate students who have to select three or five varied case studies which use GT and present them to the lecturer before they undertake geo-information project-based learning. The lecturer would use the concept of geo-inquiry process to question them. The geo-inquiry process is referred to by Myles (2019), ESRI (2003) and National Geographic Education (2017) as including 5 stages: ask, collect, visualize, create and act. After the graduate students satisfactorily complete their initial presentation, they will be assigned to undertake the geo-information project-based learning. Graduate students' presentations are evaluated by the lecturer asking to see the world, and all that is in it, in spatial terms. Similarly, research methods also ask one to explore, analyse, and act upon the things one finds. The steps of geographic inquiry are shown in Figure 1.
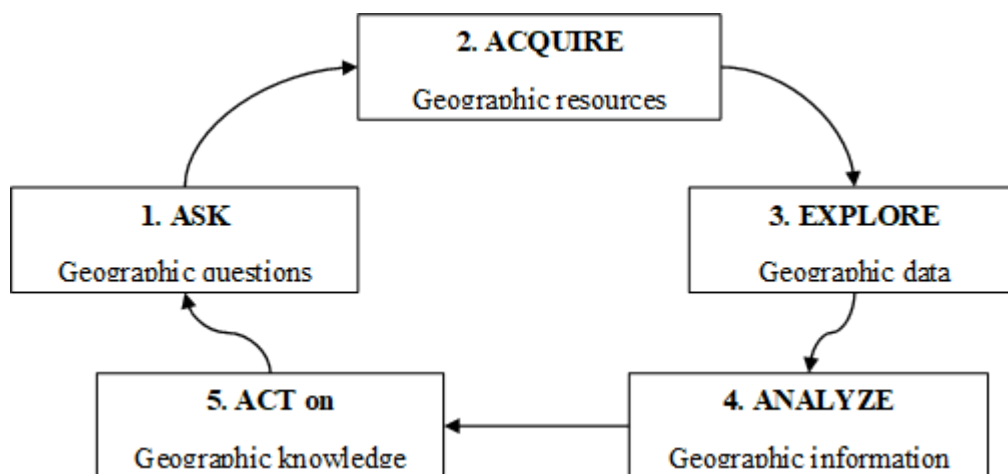
Figure 1: The steps of geographic inquiry (Modified from ESRI, 2003)

2.1 Ask geographic questions

Students are directed to think about a topic or place from the graduate students' case studies, and identify something interesting or significant about them. Then, the lecturer poses a question, e.g., 'Why do these case studies select this study area?' or 'Does it matter if that study area is moved to other areas?' By turning an interesting observation into a question, one can focus the exploration. Good geographic questions range from simple to deeper questions. Importantly, a good question should set up a good exploration.

2.2 Acquire geographic resources

This step is about acquiring geographic resources, help graduate students to consider at least aspects of the issue: geography, time and topic. Essentially, the lecturer should question them as follows:

- What is the geographic focus in each of the case studies? Defining the geographic focus helps students define the scale (global, regional, local) of their inquiries, and helps them define the extent (a city, a country, a continent, the globe) of their inquiries.

- What period of time does each case study need to collect the data? This question focuses on past events, requires historical rather than contemporary data.

- For any specific topic, what data does each case study require? This question helps students define their focus, and thus the less likely they are to get lost in piles of unrelated and unnecessary data.

2.3 Explore geographic data

Geographic data were explored using maps, tables, and charts. In particular, maps are valuable because they give graduate students a powerful view of patterns, or how things change over space. Maps also allow them to integrate different kinds of data from different sources – pictures (aerial photos, satellite images) and features (roads, rivers, borders) – in layer after layer. By integrating maps with tables, charts, and other representations, some patterns may begin to appear; patterns that might spur graduate students to refine their original questions, or to seek out one more set of data.

Such refinement at this stage is common and sensible. For example, when first exploring regional rainfall patterns, one might not have anticipated that one would need the locations of mountain ranges, but having this data might just make a difference.

2.4 Analyze geographic information

The lecturer should ask the students to highlight key comparisons, or expose patterns that had lain hidden during initial explorations. This leads to the following stages: focus on relationships between layers of information; make inferences about the distribution of things; calculate the degree to which the presence of something affects the presence or character of something else. The next step is the deeper questions – 'Why is it there?' and 'so what'

2.5 Act upon geographic knowledge

Graduate students have used GIS or paper-pencil techniques to integrate data from multiple sources and to weave them into knowledge that enables them to act. Being geographically wise means acting on the geographic knowledge that they have gained. Understanding the widespread linkages and helping others see how their lives are affected means 'thinking globally, acting locally.' Acting on geographic knowledge means being willing to answer the question, 'Now what?'

Results

Based on teaching experience over the period 2012-2019, this teaching methodology has continually applied the before-after approaches of pedagogy and praxis to AGST subject for RMUTI graduate students. Under this before-teaching and assessment approach in geo-information project (Table 1), it was found that out of the 14 RMUTI graduate students, during 2012-2019, 5 graduate students (35.71%) who were interested in doing thesis or IS on geo-information technology with level 8 had a total average score of 80.19 points while 9 graduate students (64.29%), were not interested with level 4 had an average score of 48.50 points. On the contrary, the after-teaching and assessment approach in geo-information project (Table 2 and Table 3), found that graduates were able to use geo-information project-based learning to undertake their theses or ISs (12 graduate students or 86%) got a total average score of 91.78 points, while the remaining 2 graduate students or 14% only acquired the knowledge, although they did not use it in their thesis or IS, had a total average score of 83.44 points. Interestingly, the 14 graduate students, interested in doing a thesis or not, got into learning geo-information project, had more geo-information skills (which can be seen from the sum of average scores of the two groups in Table 2). Importantly, these theses or ISs and published papers exhibited a development of graduates' knowledge, skills, and practice of geospatial thinking in a variety of educational contexts. Each of the IS or theses or the published papers addresses an aspect of the research gap that deserves timely attention in the field, focusing on curriculum design, pedagogical approaches, exemplary resources or tools, and strategies to move forward for the promotion of geospatial teaching and learning. Continued research efforts to accumulate knowledge about curriculum, instruction, and assessment, as well as teachers' professional development that can help students become 21st-century citizens equipped with geospatial literacy is to be encouraged. Further research is

recommended on the theories that can help explain and guide the development of graduate students' geospatial knowledge and skills in both formal and informal education, and effective ways to incorporate geospatial thinking into teacher preparation programs. Furthermore, over the eight years of the study, lecturers have faced advances in geospatial technology including cloud-based GT applications and increasingly sophisticated software, etc. Consequently, lecturers and graduate students have to develop or improve and learn how to use advanced GT for research, these and also IS too.

Table 1 Teaching and assessment of the before-learning in geo-information project

Teaching topics	Average score-based on five graduate students	Average score-based on nine graduate students
1. Concept knowledge		
1.1 GIS	14.10	10.11
1.2 RS	13.70	9.15
1.3 GPS	10.41	9.12
2. Geography and spatial thinking		
2.1 Knowing where something is	12.16	5.56
2.2 How its location influences its characteristic	11.11	5.71
2.3 How its location influences relationships with other phenomena	10.71	4.85
3. Interesting for doing thesis or IS or not and why (Understanding level from 1 (the lowest) to 10 (the highest))	8.00	4.00
Total average score (of 100- full score)	80.19	48.50

Table 2 Teaching and assessment of the after-learning in geo-information project

Teaching and asking topics	Average score-based on twelve graduate students	Average score-based on two graduate students
1. Asking basic geographic questions	19.21	18.06
2. Acquiring geographic resources	18.01	17.03
3. Exploring-geographic data	18.22	17.11
4. Analyzing-geographic information	17.78	15.23
5. Acting on geographic knowledge	18.56	16.01
Total average score (of 100- full score)	91.78	83.44

Table 3 Theses or ISs and published papers for graduate students during 2012-2019

No.	ISs/Theses Name (Year)	Graduate student	Published paper
1	Geo-Infomatics System of The Health Survellance for Patient's Home Visiting in Non Thai District, Nakhon Ratchasima province (2012)	Ms.Pitiwan Faikhoksung	Faikhoksung, P., Janatakat, Y. and Kranka, S. (2013). Geoinformatics for Health Surveillance of Nonthai Hospital: A Case Study of Nonthai District Nakhon Ratchasima Province, Thailand. The 33rd Asian Conference on Remote Sensing, Japan: Curran Association, Inc., 518-523.
2	Development of Information System for Cooperative Education in Faculty of Humanities and Social Sciences, Nakhon Ratchasima Rajabhat Univerisity (2012)	Ms.Marisa Kaekangplu	Kaekangplu, M. and Jantakat, Y. (2013). Development of Information System for Cooperative Education in Faculty of Humanities and Social Sciences, Nakhon Ratchasima Rajabhat Univerisity. 2013. 2nd Phayao Research Conference on January 12-13, 2013 at Phayao University, Phayao province.
3	Model of Public Park Areas' Expansion in Nakhon Ratchasima City Municipality (2013)	Mr.Teerawat Siriwimonpong	Siriwimonpong, T., Jantakat, Y. and Kranka, S. (2013). BIOCLIM-GIS for Studying Distribution of Public Parks in Nakhonratchasima City Municipality. (2013). The 1st Geoinformatics Conference for Graduate Students and Young Researchers (GI-GRAD2013) on June 20-21, 2013 at Suranaree University of Technology, Thailand.

Table 3 Cont'd

No.	ISs/Theses Name (Year)	Graduate student	Published paper
4	Monitoring System for Building Construction Permission of Civil Engineering Office Nakhon Ratchasima City Municipality (2013)	Mr.Tossaporn Desutti	Desutti , T., Jantakat, Y. and Kranka, S. (2013). Monitoring System for Building Construction Permission of Civil Engineering Office Nakhon Ratchasima City Municipality. The 1st Geoinformatics Conference for Graduate Students and Young Researchers (GI-GRAD2013) on June 20-21, 2013 at Suranaree University of Technology, Thailand.
5	Modelling of Ordered Weight Averaging and GIS for Road Sections' Risk and Factor Ranking on Highways (2013)	Ms.Wammai Amornkanjanawat	Amornkanjanawat, W., Jantakat, Y. and Kranka, S. (2013). System Development of OWA-GIS on Web for Finding Road Sections' Risk. The 1st Geoinformatics Conference for Graduate Students and Young Researchers (GI-GRAD2013) on June 20-21, 2013 at Suranaree University of Technology, Thailand.
6	GIS Web Application for Breast Cancer Data Service Ranking of Fort Suranaree Hospital (2013)	Ms.Praewpailin Hormklin	Hormklin, P., Jantakat, Y. and Kranka, S. (2013). Spatial Modeling of Communities in 10 periods (from 2002-2012) for Risk of Breast Cancer Occurrence using The Geographically Weighted Regression (GWR). The 1st Geoinformatics Conference for Graduate Students and Young Researchers (GI-GRAD2013) on June 20-21, 2013 at Suranaree University of Technology, Thailand.
7	Application of Geographical Information System and Tree Diagram Concept for Supporting Spatial Data of Telecomunication in Nakhon Ratchasima Province (2014)	Mr.Pratchayasan Konin	Pratchayasan Konin, Yaowaret Jantakat and Sanun Kranka. (2015). Geo-Informatics Technology Application for Telecommunication. The 7th Conference of Electrical Engineering Network of Rajamangala University of Technology ISAN (EENET 2015).

Table 3 Cont'd

No.	ISs/Theses Name (Year)	Graduate student	Published paper
8	Geo-Infomatics Application for Taxation Ranking of Households in Moo No.3, Neunkho Municipalities in Klaeng Rayong Province (2016)	Ms.Wannita Navanin	Navanin, W. and Jantakat, Y. (2015). Geo-Informatics Application for Households' Ranking To Income Taxation, Moo3 of Neunkho Tambon Municipality. The 7th Rajamangala University of Technology National Conference (7th RMUTNC) at Rajamangala University of Technology ISAN, Nakhon Ratchasima province.
9	Applied Geo-informatics Technology for Estimating Carbon Credit in Urban Green Area of Nakhonratchasima City Municipality (2016)	Ms.Jiruttigarn Supgetwong	Supgetwong, J. and Jantakat, Y. (2016). Applied Geo-Informatics Technology for Estimating Carbon Credit in Urban Public Park: Interpretation of Land Use and Urban Public Park. 7th Engineering, Science, Technology and Architecture Conference on July 25-26, 2016 at Rajamangala University of Technology ISAN.
10	Application of Geographical Information System for Risk-Spot Assessment of Agriculture and Agricultural Cooperatives Bank's Business Loan, Huai Rat Branch, Buriram Province (2016)	Mr.Kisda Thuaprakhon	Thuaprakhon , K. and Jantakat, y. (2016). Application of Geographical Information System for Risk-Spot Finding in Case of Business Loan of Bank for Agricultural and Agricultural Cooperatives (BAAC) at Huai Rat District of Buiram Province. 7th Engineering, Science, Technology and Architecture Conference on July 25-26, 2016 at Rajamangala University of Technology ISAN.
11	Geoinformatics for Ranking Accessibility of Base Stations' Mobile Phone Signal in Muang District of Nakhon Ratchasima Province (2016)	Mr.Rat Sorathitikran	Sorathitikran, R., Jantakat, Y. and Kranka, S. (2016). Geo-Informatics Application for Communities' Access Ranking on Mobile Phone Network. 12th Graduate Research Conference on May 14, 2016 at Phranakhon Rajabhat University.
12	Geographic Information System for Supporting Internship Management (2016)	Ms.Supattra Rengprapan	Rengprapan, S., Jantakat, Y. and Rabiabpho, T. (2016). Geo-Informatics Technology for Supporting Internship via Web. 7th Engineering, Science, Technology and Architecture Conference on July 25-26, 2016 at Rajamangala University of Technology ISAN.

Table 3 Cont'd

No.	ISs/Theses Name (Year)	Graduate student	Published paper
13	Potential Assessment of Maize Cultivation based on AHP in Muang District of Nakhon Ratchasima Province (2016)	Ms.Uthaiwan Julramusik	Julramusik, U. and Jantakat, Y. (2016). Geo-Informatics Technology Application for Suitable Rating of Exiting Maize Area in Muang District of Nakhon Ratchasima Province. 7th Engineering, Science, Technology and Architecture Conference on July 25-26, 2016 at Rajamangala University of Technology ISAN.
14	Web Application for Medical and Wellness Tourism in Affluent Group Case Study Wang Nam Khiao District and Pak Chong District, Nakhon Ratchasima Province (2018)	Ms.Ruetaichanok Apainiphat	- Apainiphat, R. and Jantakat, Y. (2017). Studying of Tourists' Behavior for Group of Affluent and Medical and Wellness Tourism in Nakhon Ratchasima Province. The 11th National Graduate Conference on November 23-24, 2019 at Kasetsart University. - Apainiphat, R. and Jantakat, Y. 2018. Information System for Medical and wellness tourism in Affluent Group case study Wang Nam Khiao and Pak Chong district, Nakhon Ratchasima Province. The 3rd National Conference (RTUNC 2018) on May 25, 2018 at Ubonratchathani University, Thailand.

Conclusion

Using this teaching methodology it was found that 14 graduate students during 2012-2019 were able to use geo-information project-based learning to undertake their theses and ISs (12 graduate students or 86%), while the remaining 2 graduate students or 14% only acquired the knowledge although they did not use it in their theses or IS. On the contrary, before-learning geo-information project, an evaluation was performed and 5 graduate students (35.71%), who were interested in doing thesis or IS on geo-information technology scored a total average of 80.19 points while the remaining 9 graduate students (64.29%), who were not interested scored a total average of 48.50 points. In addition, the collection of 14 ISs or theses and 15 published papers illustrates an increased attention to and keen interest in the practice of geospatial teaching and learning in geography. The AGST teaching encourages continued research efforts to accumulate knowledge about curriculum, instruction, and assessment, as well as teachers' professional development that can help students become 21st century citizens equipped with geospatial literacy.

Further research is recommended on the theories that can help explain and guide the development of students' geospatial knowledge and skills in both formal and informal education, and effective ways to incorporate geospatial thinking into teacher preparation programs. Furthermore, over the eight years of the study, lecturers have faced advances in geospatial technology (GT) including cloud-based GT applications

and increasingly sophisticated software, etc. Consequently, lecturers and graduate students have to develop or improve and learn how to use advanced GT for research, these and also IS too.

Acknowledgements

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Knowledge Creation of Adaptive Learning on the Blockchain System
-Collaborative Cloud Educational System-

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Abstract

The major difference of the networked society from the conventional analog society is its potential of increasing the continuity of time and space. That is, it transcends the boundaries between individuals and organizations, private and public sectors, family and work, business and pleasure, producers and consumers, the national and local governments, different disciplines and so on. With this continuity based upon an advanced ICT infrastructure, tacit knowledge, which is the most difficult yet valuable type of knowledge to be transmitted that is gained through personal experiences and stored within individuals, has better chances to be transferred and shared. Therefore, building a platform to make tacit knowledge more accessible and sharable in the society is essential. In this paper, we would like to discuss Adaptive Collaboration, which integrates different systems and applications into one comprehensive system. The Adaptive System holds the potential to connect different entities such as corporations, university lecture, and Project Based Learning to enable the Adaptive Learning (AL) which is critical to meet the increasingly diverse needs of the Ubiquitous Society. The structure of this paper is as follows: First, we introduce the AL and discuss the potentialities of application of the Cloud System based on the Block Chain Technology. Second, we refer the experimental pilot study on the AL and provide further observation for applying the AL. Third, we discuss how this Society utilizing the Cloud Services based on the AL would affect the lectures and AL.

Keywords: Block Chain, Adaptive Collaboration, Adaptive Learning, Cloud System

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Introduction

The future direction, and agendas for e-Local Governments are to re-build the deteriorated fiscal structure in public administration with innovative management minds, and to promote administrative autonomy by decentralizing the society, while many Local governments suffer from their depreciated financial situation. Under these situations, IT systems should be mutually worked between central and local government. It avoids overlapping investments of the ICT utilization and development by determining the development methods. In this paper, we discuss the potentialities of standardization for promoting the certification of digital contents and originality .in order to swiftly and appropriately satisfy a central and local organizations, further development and utilization of IT and its infrastructure in the local municipalities.

In our modern clock-ruled culture, it is not too much to say that no society can exist unless based on "time". Computers, which are the key device of an information society, are equipped with high precision clocks to synchronize their entire circuit function. In an electronic environment or digital society built on computers, recordkeeping relates inevitably to the time that is ticked away by the clocks embedded in the computers. Time is thus the infrastructure of this information society. However, the importance of securing evidential authority of electronically determined time, and synchronizing clocks of multiple computers working in cooperation are not recognized enough.

To save the situation, a notion of time for the digital society should be properly defined and popularized, specifying the way and conditions of using it safely. Time Business Forum was established to diffuse the time notion for the digital society. We focused mainly on time-stamp use by national and local governments to produce a general study for both users and providers.

Currently, there are various services available that utilize the Internet. Additionally, more and more services are newly created to meet users' diverse needs by incorporating existing services and social infrastructures. Nonetheless, many of the existing services are often provided with specifications unique to each service provider, making it difficult or even impossible to integrate them with existing social infrastructures. Therefore, it is essential to develop a scheme that incorporates different services and infrastructures without boundaries of specifications.

Traditionally, many services were provided by locally connecting computers. However, with the rapid and widespread diffusion of the Internet, the demand for integration remotely or globally has increased. Consequently, there emerges an increasing need for the development of technologies that incorporate different systems. However, implementing the same technology used for connecting computers locally into a system connecting computers globally is costly and time consuming.

The social infrastructure is a wide concept, and it includes so many various entities. Today, not only information and communications technologies (ICT) including broadband networks and mobile phones but also the logistics and sales systems are prevailed as social infrastructures. Nonetheless, there are still few models that

transcend the difference of business types and industries, and connect them altogether to provide a new service.

For the demonstration experiment, we selected the Business to Consumer (B to C) model. The model we built aims to utilize different social infrastructures, and coordinates with other services regardless of their business types and industries to offer convenient and effective services for users. We developed the Adaptive Authentication System that provides user-centric services as well as the authentication system essential for coordinating different systems.

Project Based Learning (PBL) is an innovative instructional strategy that has been widely applied at educational institutions of variety of levels. PBL encourages students to engage in "real world" problem-solving investigations. It also allows students to autonomously conduct their study in a more constructive manner as well as develop the critical thinking skills of causal reasoning. Likewise, current Knowledge Management (KM) theories and practices have in many ways played equally important roles in corporations and educational institutions. KM and education share the same philosophies that play critical roles at many organizational levels that require an efficient understanding of their collective information and knowledge.

In this article, we would like to emphasize the importance of combination of PBL, KM, and Collaborative Learning on the Cloud and the incorporation of technology into education. We also would like to demonstrate how our approach enhances student skills and abilities by introducing case studies conducted at Chuo University in Japan. We describe the mechanism of human intellectual development and knowledge structuralizing process by studying topics in cognitive science as possible aids for new knowledge creation – categorization, metaphor, and metonymy.

In this paper, we introduce the Adaptive Authentication System and discuss its potentials in the new paradigm of the 21st century networked society. It is an innovative information technology system for knowledge creation based on the Cloud Computing and Time Authentication. It is a new system that produces dynamic and valuable interactions among human resources through sharing, interlocking, and collaborating with different types of knowledge.

Blockchain is at the center of attention. But, major applications of Blockchain are related to cryptocurrency. This created a snowball of hype, that over the course of months, brought us to a sorry state of our community, once driven by the ambition to enhance humans, by empowering freedom thanks to technology, but now driven by money being made by confusion." Then, We study a new application of Blockchain.The Internet has increasingly become important. As a result, official ID on the Internet is required. The purpose of this study is to propose online identity verification using Blockchain, decentralized system.

1. Key Technologies on Adaptive Collaboration Systems

1-1. Implications of the Study

In the Ubiquitous Society, open networked information systems are vital as they enable people to collaborate with others regardless of location and type of business. In that environment, we will experience shifts in our communications both in terms of quantity and quality. Not only "Human-to-PC," but a new pattern of "PC-to-PC" will expand the dimension of communications. The information we share with others will include not only textual information but a disparate range of data and information and including knowledge that is essential for decision making.

Therefore, the primal benefit of collaboration is the sharing of knowledge, information, and data with others. In order to realize this, there needs to be a space or "*ba*" where a variety of applications help users to produce new knowledge, information, and data that are appropriately shared and re-used among users. We conducted a demonstration experiment to examine technologies that are essential to build this knowledge sharing environment.

The information and knowledge sharing space has two distinctive attributions – static and dynamic. One is that it statically unifies the management of information and related behaviour, and the other is that it adds actions to make it adaptive to the dynamic operation processes. The stored data are structured for the purpose of re-use, hence it is also the "*ba*" that encourages knowledge recycling.

Since there are many possible operations imaginable that are suited for the Adaptive Collaboration, its goal is to provide users with a workspace to accomplish their own tasks instead of simply offering functions such as word processing or spreadsheet applications. The workspace may offer email and bulletin board services or document management services. The possibilities are infinite as it is also able to integrate specialized applications for each operation into the user interface.

1-2. Requirement and Purpose of the Study

For successful collaboration, it is essential that data, information, and knowledge are continuously stored and can be shared among many individuals. In order to do so, it is critical not only to build a reliable infrastructure and developed network, but also to consider how the data should flow on the network along with how the data should be applied and utilized. For certain fields, it is strongly preferred that contents still be usable without depending on specific applications or software, or when values are changed 100-200 years from today. That is, data and content need to be constantly viewed, utilized, and processed by many users. Furthermore, the system needs to be flexible enough for the distribution and re-use of data and content as they might be stored at dispersed locations at different times.

Therefore, the essential requirements for AC are the following: 1) users are geographically-dispersed and belong to different organizations, 2) knowledge information is easy to store and retrieve, and long-term information storage needs to be safe and secure, 3) knowledge information needs to be available for high-level

statistical processing and analysis, and 4) it operates uninterruptedly, and it is low in cost and highly-reliable.

The purpose of the study is to realize the real-time AC environment through data sharing. For this purpose, we conducted the following experiments: 1) a demonstration experiment on the Storage Management which enables users to share information located in the iDC storage, 2) a demonstration experiment on data management by applying XML Web Services into the real-time collaborative work system through data sharing ([13]2004 [11]2003a).

2. Adaptive Collaborative System

2-1. Adaptive Collaborative System

For ensuring the durability and universality of data, it is important to standardize a character encoding scheme and data structure as well as a system that reconstructs and personalizes data according to the need of a user. In terms of data structure, it is necessary to standardize data format that is both open and global for the purpose of information transmission and distribution across the world. In terms of personalization, it is indispensable to consider how to systemize knowledge so that a system could tailor and reconfigure data for each user depending on a situation to utilize stored data. Collaboration can be divided into three categories from the perspectives of a long term use, "ba" on the Internet, and application of the XML Web services technology into digital data: 1) intensive utilization of network infrastructure, 2) network utilization for information and knowledge, and 3) integrated utilization of distributed data in a large area.

For security of transactions and procedures taking place on the digital network, evidence of the existence of relevant facts and proof of document delivery are also necessary. Therefore, along with digital signature, time-stamp is essential to authenticate (guarantee) that a digital document existed at a certain time.

It is expected that time-stamp will be effective in the following functions and services:
• Evidence of the existence
To guarantee that digital contents existed at a certain point of time.
• Proof of delivery
To prove that a transmitted document has reached the recipient, as well as that the recipient have received the document. Also known as "delivery evidence" which is equivalent to delivery certificate used in existing postal service. This contributes to avoiding repudiation threat.
• Long storage of electrically signed documents

To secure authenticity of a digital contents over time by providing existential evidence. The proper time of document verification information is authenticated in order to cope with digital documents exceeding the PKC validity period or key algorithm compromised.

In order to realize this open and flexible data structure and information distribution, it is necessary to conduct demonstration experiments in the following ways:

- Providing and integrating an *Active* utilization environment and a *Static,* long term environment on the network, an *Adaptive* space.

MAN (Metropolitan Area Network + iDC (Internet Data Center)

- Building an environment with the XML Web Services technology that is independent of a system and application.

In order to examine the feasibility of these mentioned above, we conducted a demonstration experiment. First, we examined the possibility of collaboration among corporations, universities, and research institutions by building an information sharing environment prior to applying XML Web Services into the data management system which utilizes the information stored within the iDC. Second, we examined the effectiveness of the data storage system and evaluated whether the external applications are capable of high-level utilization such as its proficiency of producing knowledge out of information, presenting data effectively, and storing know-how. (Fig. 1,2)
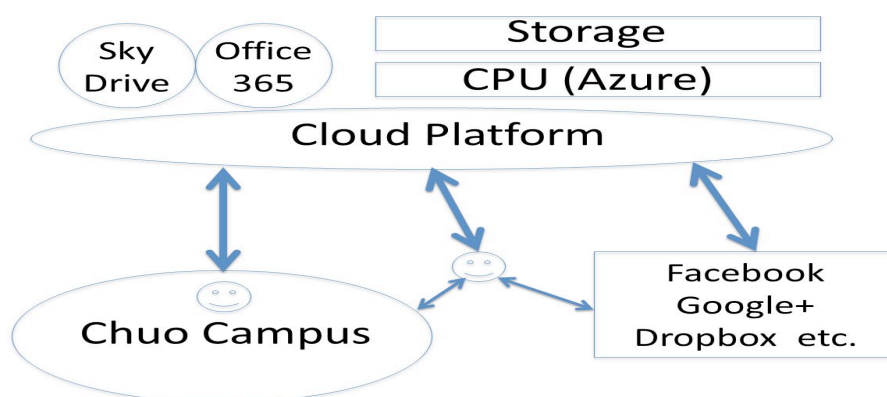
Figure1: Adaptive Collaborative Learning System1 （1st System of 2013−2015） [6]
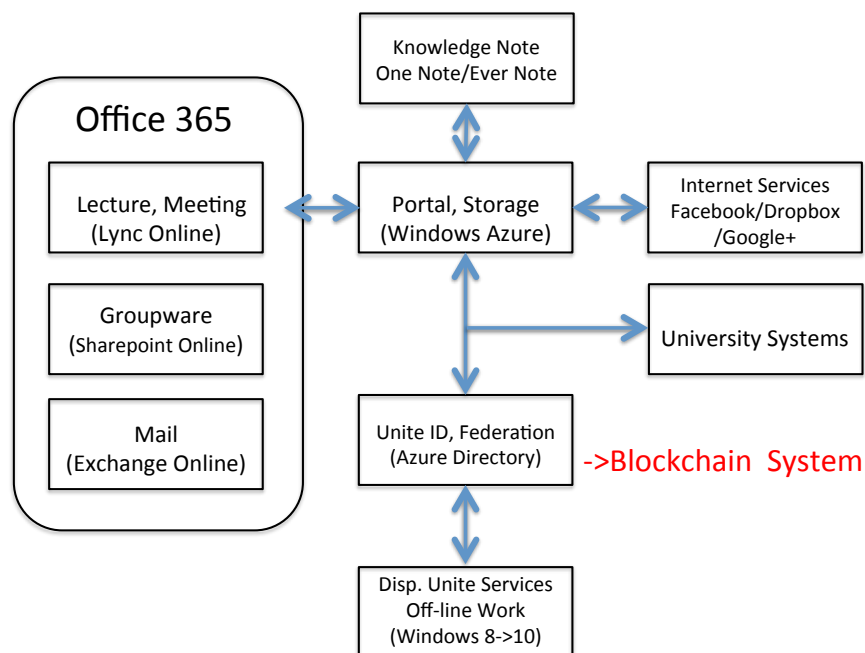
Figure2: Adaptive Collaborative Learning System2

2-2. Adaptive Collaborative Authentication

The demonstration experiment proved that real-time discussion with sharing data and resources among the geographically-dispersed teams was possible. Furthermore, we confirmed that it is possible to collaboratively edit and process image data between remote locations using a high-speed network.

For the future agenda, if we plan the long-term use of the system, it is necessary to consider how to manage the Web services and how to develop and spread its computer architecture in corporations. In other words, in order to administer the relationship between different Web services on the multivendor delivery platform, it is necessary to consider how to manage many different components involved in this system such as network operation management, service management, and Web Services management including ERP, CRM, SCM, EAI, and, EC.

Physically storing files and data and keeping them readable for a long time do not necessarily mean keeping them understandable for a long time. It is critical for a variety of systems to be able to cooperate in order to process diverse data while extensively accessing meaningful data. To facilitate this, it is essential to utilize a unified meta-standard technology such as XML and Blockchain , and to add autological, self-explanative description onto data themselves.

2-3 Time Authentication

As already mentioned, digital signature is a means to enable personal verification and content authenticity of digital documents, which are involved in transactions and procedures to be secured. For security of transactions and procedures taking place on the digital network, evidence of the existence of relevant facts and proof of document

delivery are also necessary. Therefore, along with digital signature, time-stamp is essential to authenticate (guarantee) that a digital document existed at a certain time([9]Ohashi,M.,2003a).

It is expected that time-stamp will be effective in the following functions and services:
• Evidence of the existence
To guarantee that a digital document existed at a certain point of time.
• Proof of delivery
To prove that a transmitted document has reached the recipient, as well as that the recipient have received the document. Also known as "delivery evidence" which is equivalent to delivery certificate used in existing postal service. This contributes to avoiding repudiation threat.
• Long storage of electrically signed documents
To secure authenticity of a digital document over time by providing existential evidence. The proper time of document verification information is authenticated in order to cope with digital documents exceeding the PKC validity period or key algorithm compromised.

3. Mechanism of Authentication on Blockchain System

Time Authentication provided the certify of originality of Contents and Blockchain provided the identity authentication of the distributed system.

3-1. Mechanism of Authentication using Hash Function

Time authentication infrastructure can be technically defined as a system infrastructure for providing standard time distribution, time-stamping, and other related services. The standard time distribution service is conducted by Time Authorities (TAs) in place of National Time Authority (NTA), while the time-stamping service provides evidence that a data item existed before a certain point in time, based on the time source distributed from NTA or TAs.

This chapter describes the mechanism of time authentication infrastructure, which supports time-stamping services. Time-stamping service systems (i.e. time-stamp token issuance and validation systems) described here are based primarily on the international standards such as RFC 3161 and ISO/IEC 18014.

3-2. Usual Time Authentication Service Model

The following paragraphs outline a time authentication service model applied to e-application system of the system.

・CA
Certification Authority, which issues NTA, TA and TSA with appropriate certificates or PKCs for digital signatures. Some time-stamping systems do not involve this player.

・TST verification player

Verifies the validity of time-stamp tokens. The entity of this role can be different depending on time-stamping system. TSTs based on simple protocol system can be verified on PKI by clients themselves. In the case of the TSTs based on linking protocol system, TSA, who issues the tokens, or some other third party becomes the player.

・Applicant

Students use applications, or the software and tools. They follow application formalities in communication with the application acceptance system of thesystem. They can make a request to TSA for time-stamps to prove their applications' existence. In the case of some trouble, they verify the validity of TSTs issued from the local government, by using the TST verification player.

・University

University providing application services for students, or the application system itself. Based on time-stamping services provided by TSA, the University gives time-stamps to application forms from applicants, acceptance notice, result notice and other documents produced during the application transaction. In the case of trouble, it verifies the validity of TSTs it has issued, by using the TST verification player.
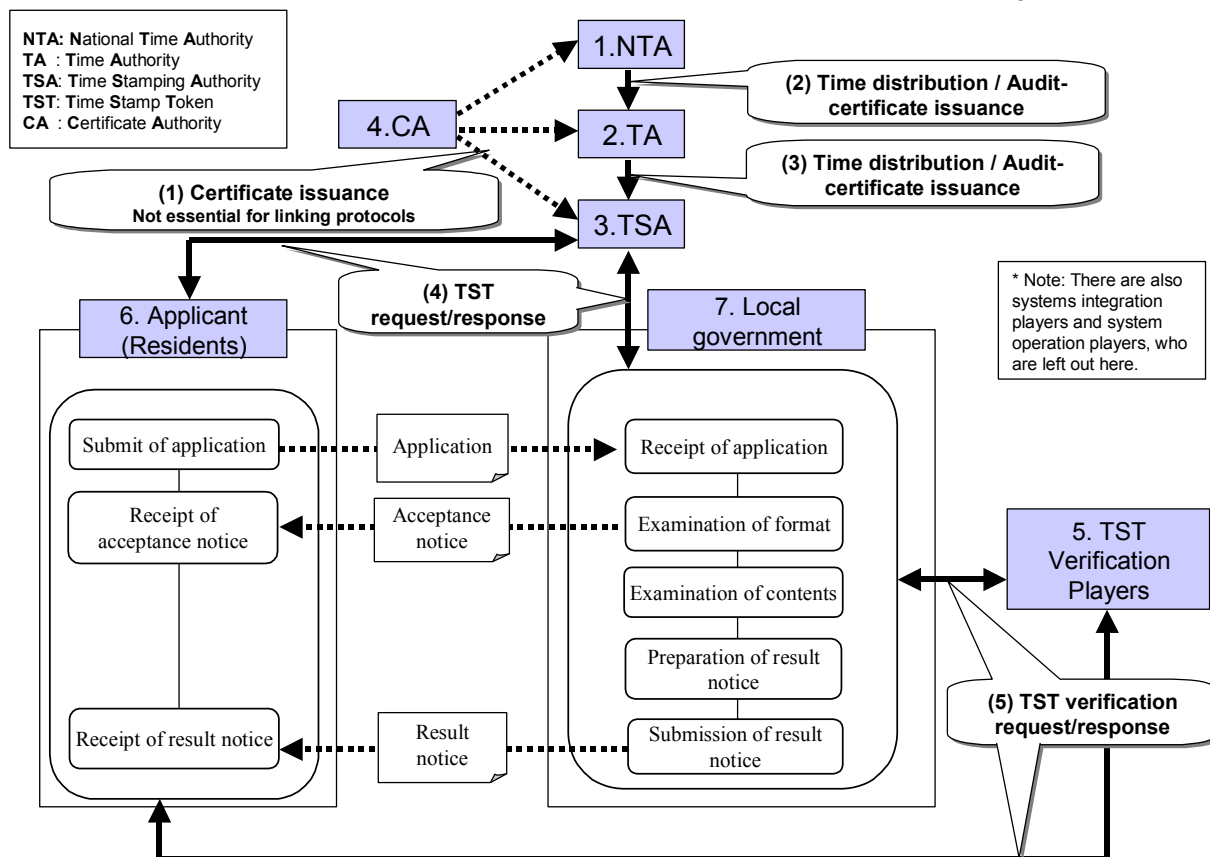
Figure 3 Time Authentication Service Model for E-application Transaction [23]

3-3. Blockchain System

We built a Blockchain System; 1.Make a Block, 2.Make a Chain, 3.Search a Chain, 4. Arrange a Chain, 5.Connect the System. Blockchain system included the hash function of certification. Blockchain identity verification is different from centralised identity verification relying on organization and system. Individual distributed authentication can manage easily the distributed system and the certificate contents.

Conclusion

To become widely approved in society, the time notion for an electronic environment needs to win public awareness, trust and daily opportunity as well as technical support. Given that the modern world is based on "time", an electronic/digital world can be based on an integral structure that authorizes "digital trace of time". We call the whole such structure as "time authentication infrastructure", establishment of which is the objective of this chapter. Through describing the feature, importance and effects of time-stamp as a trace of time given to digital documents/data stored for future use. Consequently, time-stamp users will know business application standards for appropriate time, documents/data, trace of time and certified originality of digital contents, while providers will be suggested service quality standards such as type and reliability of time-stamp they offer.

Our study proved the effectiveness of the Time Authentication to trusted e-Procurement to create new Secure services between Public Sector and Private Sector (Citizen). Though there are still issues to cope with outside of the realm of technology including accountability of each participants and the level of the service.

The Adaptive Collaborative Learning, which has drawn attention as a new network system that supports the future Ubiquitous Society. The ACL is capable of functioning with the legacy system that has been widely utilized in organizations while integrating a number of different applications seamlessly. With these beneficial features, more innovative business activities can be conducted such as sharing the order information across the organization, improving efficiency in CRM, risk management, delivery management, profit-cost management, cash flow accounting, balance sheet adjustment, account receivable factoring, updating and comparing the transition of sales, and making strategic decision and setting practical business goals.

The ACL is the most versatile system that facilitates to realize the AC in the Ubiquitous Society. For instance of incorporating the XML Web Services, since it is solely application/system independent, this also assists the flexible coordination with other systems and creates a seamless environment for the user hence it is highly functional as a core system.

We successfully proved the validity and effectiveness of the B to C model and Authentication Roaming Technology through the experiment that connected the multi-copying machine at a Seven-Eleven store and the system of Chuo University via the Internet. Though the incorporation of social infrastructures has long been led by the service providers, with the advent of the Authentication Roaming Technology, we can finally take a user-centric approach to incorporate social infrastructures and

provide safe and convenient services for users. This new approach will enhance the efficiency of various services and allow us to create new business models.

The Ubiquitous Society is a society grounded upon the collaboration around human knowledge within organizations and individuals. The biggest bottleneck of the ACL might not be the difficulties in developing the technologies and infrastructures. Rather, it might be the introverted and closed nature of human beings.

Acknowledgement

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Annexation of Co-curricular Activities: Experiencing and Assessing Grammar Competence in EFL Context

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Abstract

Over the past few years the annexation of co-curricular activities (CCAs) in experiencing learning and assessing grammar competence have increasingly been filtered into educational discourse in EFL context. The empirical evidence based on questionnaires shows that traditional methods in grammar learning do not foster learners' potential development and confidence in assessment tests. Learners are taught and assessed in different components of grammar following only academic resources via close tests. This paper proposed to include co-curricular activities with academic contents in weekly lesson plan in experiencing grammar learning and assessment tests to 25 cohort of 1st semester of the department of English at a private university in Bangladesh. This paper collected data through triangulation methods in the means of observation, interviews, and focus group discussion via the lens of socio-cultural theory (SCT). In this study, CCAs comprised drama, song, and debate to reinforce their ways of grammar learning, foster critical thinking and assess grammar competence amidst writing scripts, lyrics and speeches. It intended to launch a transformative approach with the inclusion of CCAs to remove inhibition and fear of the learners in grammar learning and assessment tests by creating collaborative intervention with peers, teacher and learning contents. This paper investigated CCAs facilitated academic grammar learning and worked as an effective means to engage learners comprehensively, reduce their affective filters implicitly, and thus, had a great impact on achievement of continuous classroom assessment. This paper may give a new vision of learning and assessing grammar to learners and teachers in EFL context.

Keywords: Experiencing Grammar learning, Co-curricular Activities, Transformative Approach, Assessing Grammar Competence, EFL (English as a Foreign Language) Context

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Introduction

The benefits and significance of co-curricular activities (CCAs) gain its importance to be provided as an alternative means in experiencing grammar learning and assessment process in EFL (English as a Foreign Language) context. CCAs provide stress free social environment and offering these activities in teaching grammar along with academic content can be considered as valuable learning tool (Storey, 2010). According to Xiao and Luo (2009) conferring period to these activities facilitate learners to gain more comprehension about the subject matter. It is important to emphasize that learning content, the way of grammar learning and assessment process engage learners comprehensively, reduce their affective filters implicitly, and extend the assessment areas to attain inclusive competence. The grammar competence does not mean only achieving mere linguistic knowledge, rather attaining ability to apply the notion of tense and aspect to accommodate learners' communicative choices. Unlike objectivist or interactionist, transformative teaching, inspired by SCT (socio-cultural theory), is the activity of internalization and transformation of new ideas through thinking on and about these new ideas (Nehuruela-Azarola, 2003). It facilitate learners to reach potential areas through communicative activities to be able to consciously apply grammatical knowledge rather than just knowing the forms or having the skill to deploy endings in second language development. Therefore, the study included co-curricular activities following transformative approach to create stress free environment in learning and assessing grammar competence and let the student understand the significance of attaining grammar competence.

From grammar-translation method (GTM) to communicative language teaching (CLT) the perennial debate in the role of grammar, its instruction and the way of assessment leads the practitioners and researchers to go for new methods replacing grammar exercises with meaningful contexts (Brouke, 2008). A good number of research have been done on grammar learning with the inclusion of CCAs and found relationship measuring grade point average (Richie, 2018). Various authors have investigated association amid co-curricular activities and ESL (English as a Second Language) students' success (Mitchell, 2015). Some explored the links amidst co-curricular activities and academic engagement and self-efficacy (Wilson, et.al (2014). However, the way of grammar learning and assessment are still burning issues, especially in EFL context. The study draws researchers experience on the practice of applying transformative approach with the annexation of co-curricular activities in grammar learning and assessment process to attain comprehensive competence. The following study will show how CCAs following transformative approach can be an effective means to reduce inhibition and anxiety, reach potential areas and promote conceptual development in applying pragmatic, textual and grammatical concepts in second language development.

Background of the Study

Southeast university is a leading private university in Bangladesh where English is a foreign language. The department of English offers Basic English Skills course where different components of grammar are taught, e.g. tense, modals, articles, verb patter, preposition and so on by the students of first semester following different strategies. Although numerous research works have been done against direct instruction, many practitioners are continuing their grammar teaching and assessment focusing 'form'

or structure in EFL context (Brouke, 2008)). A good number of studies shows that extensive drilling, memorization are still the main ways in teaching grammar in school, college and university level in Bangladesh where learning English is mandatory (Shrestha, 2013). The way students learn grammar that has an empty structure, morphology and lexicon which requires to be presented, described, and explained through extensive drilling and memorization. The way of learning considers learners' mind as 'containers' where information will be put in and they will evoke those information during doing exercises and attending assessment tests. The assessment tests are held with discrete sentences or in the form of passage focusing 'form' to show their mastery in linguistic ability via cloze tests. The way of assessment is not process oriented rather product oriented and it never explores their ability in pragmatic, textual or grammatical concepts in second language development. It addresses only their understanding or comprehension. The way of grammar learning and assessment leads them to think language as an object, or a system. In 1997, CLT was introduced to language teaching and grammar learning following inductive approach in Bangladesh. The empirical study shows that language teaching highlights meaning in conventional communicative classroom where grammar is taught and assessed in focusing form and structure. In objectivist or interactionist approach, students do not get any further means to experience their grammar learning nor to gain confidence in assessment process through social and interpersonal activities.

Problem

These processes create challenges of "promoting conceptual reflection (i.e. the internalization and thus, transformation of new ideas through thinking on and about these new ideas" (Neguerela-Azarola, 2013b). This inability lacks critical thinking and rises affective filters higher of the learners. At tertiary level, when students are asked to develop any concept using the language, the main problem they face is in associating ideas with linguistic knowledge. The mere mastery of the form hinders them to think on or to generate new ideas in the language. They become puzzled and anxious in writing correct sentences that lowers their ability to learning and leads them to inhibition and fright to grammar learning and assessment. They never become conscious learner to orient their communicative choices.

Purpose of the Study

The study aimed to make a shift from form-focused grammar learning and assessment areas to reflection- based conceptual development. So, it tailored co-curricular activities with academic content following transformative approach to transform learners at their thinking, learning and assessment levels in experiencing and assessing grammar competence. Two main goals had been established by the researcher:
1. To reach potential areas through communicative activities in second language development rather than attaining mere comprehension in linguistic knowledge
2. To develop confidence by reducing fear and inhibition and increasing involvement and engagement in grammar learning process

Research Question

The identified problems stimulate the researcher to find out the right way in grammar instruction, and assessment process and inspire him to explore the answers through the following questions:
1. How do CCAs facilitate learners to achieve grammar competence?
2. How well can transformative approach be effective to teaching grammar?

Significance

The significant results of CCAs and transformative approach (TA) increased its usages in grammar learning and assessment process. This research is unique as it promotes strategic social interaction (Dipietro, 1987) and meaningful significant intra-action during learning different components of grammar, more specifically different sections of tense. This uniqueness nurtures learners' potentials to meet learning challenges, reduce inhibition and anxiety, create belongingness to the learning community, craft collaboration among peers-teachers-learning content and achieve the ability to consciously apply pragmatic, textual and grammatical concepts in foreign or second language development.

Data

The data is collected of 25 cohort of 1st semester in period from January19, 2019 to April 29, 2019 in teaching different components of grammar, especially 'tense'.

Data Analysis

As the main goals of the study are to achieve the ability to consciously apply pragmatic, textual, and grammatical concepts and to reduce anxiety and inhibition and increase confidence in assessment process by ensuring their engagement and involvement in second language development, the analysis is to observe the trends over the period while CCAs are introduced following transformative approach in experiencing learning and assessing grammar competence.

The following topics are analyzed in more detail (from simple to complex sentences using different tenses): engagement level in experiencing grammar learning; scripts, lyrics and speeches writings; and oral performance in using these speeches to accommodate their communicative choices. These areas gave insightful merits to the researcher to find out the justification of applying transformative approach with the annexation of CCAs to achieve these goals in experiencing and assessing grammar competence.

These insightful merits were analyzed qualitatively through triangulation methods in the means of observation, interviews, and focus group discussion via the lens of socio-cultural theory (Vygotsky, 1978).

Goals

The goal of this research is to achieve the ability to consciously apply grammatical concept in pragmatic and textual concepts through experiencing social and

interpersonal activities with the collaboration of peers, teachers and learning content during learning different components of grammar, i.e. 'tense'. The goal also want to reduce anxiety and inhibition and increase confidence in assessment process ensuring learners' engagement and involvement.

Frameworks for Actions

The Basic English Skills course is offered to the students of 1ˢᵗ semester for improving grammatical knowledge to develop language proficiency in four skills: listening, speaking, reading and writing. The classes are held twice in a week. Along with midterm and final examination, classroom assessment is very important part of learning and achieving grammar competence. Students are assessed in the four skills throughout the semester in every class which give them opportunity and sufficient time to experience their learning through more practices with the inclusion of co-curricular activities following transformative approach.

According to ministry of education, Singapore (2018), co-curricular activities (CCAs) is an integral part of holistic education that fosters learners' critical thinking to meet their learning challenges, nurture their learning abilities to work within a given structure and construct creative outlook to their education and academics. These activities create their belongingness and community feeling to learning content. Stress free environment is the primary condition of successful L2 acquisition (Krashen 1981). As the CCAs create stress free environment, provide clarity and improve organizational skills and time management (Greg & Narelle, 2017) the researcher transformed their experiencing learning and assessment content into scripts, lyrics and speeches writings and oral performance playing drama, song and debate respectively.

Whereas SCT or socio-cultural theory (Vygotsky, 1978) views learning as inherently a social process activated through the 'zone of proximal development (ZPD)' (Dillenbourge, 1999), transformative approach inspired by SCT focus on 'zone of potential development (ZPOD)' (Negureula-Azarola, 2013b). The ZPOD concept leads to think language development is the result of a process of appropriation and internalization of concepts mediated by social and interpersonal activities (Gracia, 2012). According to Negureula-Azarola (2015) Transformative pedagogies for the ELT classroom are about engaging and contributing with others in social interaction and this is the origin of conceptual intra-action in L2 learning and development. The development implies that a learner is grammatically correct when speaking or writing not because knowing the forms or skill to adopt endings but they understand and able to apply the notion of tense and aspect to orient their communicative choices (Gracia, 2012).

The worthy themes of co-curricular activities following transformative approach, the possibility of its usages to grammar learning and success in second language development stimulate the researcher to cultivate the following issues to achieve the competence:
1. To change the pre-occupied mind set up of previous way of grammar learning and assessment
2. To learn in collaboration with peers, teacher and learning content
3. To remove fear and inhibition
4. To foster critical thinking on and to generate new ideas

5. To create space to experience the learning between learning and assessment
6. To extend the areas of assessment process
7. To shift from ZPD to ZPOD in learning process
8. Performance are important part of achieving competence
9. Drama, song and debate are interesting and relaxing activities

Actions

The way of learning took place in two steps: learning and experiencing learning. The assessment also extended its areas to engagement and confidence in applying the knowledge of Tense. As students were already aware of the rules or form because of their school and college levels grammar learning, ample examples have been taken from different sources to give them opportunity to review their knowledge of 'Tense'. They were also asked to relate those information to their own lives that leaded them to think on and helped them to create new knowledge through writing and speaking. The errors and mistakes were corrected in collaboration with peers, teachers and learning content through participation and discussion. The pre-occupied mind set up of the way of form-focus grammar learning had been removed showing the importance of creativity in developing second language.

The uniqueness of this study is that the learners experienced learning 'Tense' amidst writing scripts, lyrics and speeches in a group in and out of classroom. Five students were in each group where strategic social interaction (Dipietro, 1987) and meaningful significant intra-action (Garcia, 2012) ensure every ones' almost equal participation to writings. Students were guided not only to write but also to practice verbally and present their assignment in the form of drama, song or debate in classroom through performing these activities. The assessment process observed not only accuracy but also their ability to orient their communicative choices in generating new knowledge and developing the language in writings. The assessment process also observed their confidence level during performing their assigned topic to ensure their engagement and involvement and to reduce their anxiety and inhibition. The researcher kept the record of observation by taking note in prescribed form. As these activities and assignment were included in weekly lesson plan, they could experience this practice throughout the semester to strengthen their ability in applying grammatical knowledge to develop pragmatic, textual concepts. The interviews and focus-group discussion provided learners positive perception and interest in the way of learning and assessing grammar competence.

Results and Discussions

The combination of all aforementioned actions and steps showed the positive trends in facilitating grammar learning and assessment. The assessment were focused on accuracy, ability to orient communicative choices and ability to develop concept in generating new knowledge of the language. Each group got the opportunity to experience their learning five times. Every time the trends in these areas went up. In general, the accuracy level increased from 50% to 80%; ability to orient communicative choices boosted from 40% to 70% and conceptual development enhanced from 60% to 80%.

The actions and steps of learning and assessment also increased learners' engagement level. The engagement have been ensured through observing their participation and interest. The stress free and relaxed values of CCAs increased their belongingness and interest. The level of inhibition and anxiety were also reduced.

The participants to experiencing grammar learning comprehended and acknowledged through their interviews and focus group discussion that they should not only have grammar knowledge to achieve accuracy but also need to achieve the ability to consciously apply grammatical knowledge in developing concept. They believed stress free environment was very important to nurture their abilities to learning. They thought that classroom learning should promote group work outside of classroom that would facilitate and accelerate doing social and interpersonal activities under the umbrella of CCAs following transformative approach.

The annexation of co-curricular activities following transformative approach let the students to learn grammar going beyond academic learning content in and out of classroom. Their writing topic required logical, emotional and communicative expression along with accuracy amidst writing scripts, lyrics and speeches. They rehearsed several times about what to say and write for performing drama, song and debate. In writing they got feedback from each other not only in correcting form or structure, but also in choosing lexical item and developing concept. These steps reinforced their grammar learning and promoted them to reach potential areas through these communicative activities. These learning process and activities created their community feeling and belongingness to the learning topic and helped them to remove inhibition and reduce anxiety to grammar learning. As every group performed in classroom, they gave more effort out of classroom for better performance. This environment created the space for autonomous learning and increased their self-esteem and confidence. This way of learning and learning activities facilitated the teacher to consider their writing and oral performance as part of their continuous classroom assessment as well.

The researcher had collected data from the beginning of the semester and analyze these trends till the end of the semester. The researcher found positive trends not only with one group but also with rest of the four groups. The performance varied from group to group in writing and speaking but all groups showed upward trends to their abilities.

Conclusions

In conclusion, this study revealed some significant results regarding the way of grammar learning, the importance of inclusion CCAs in experiencing grammar learning and extending the areas in assessing grammar competence. The learning steps and assessment process gave the learners opportunity to experience their grammar learning, brought changes to their traditional way of grammar learning, helped them to know how to achieve inclusive grammar competence. The study showed co-curricular activities following transformative approach reduced learners' inhibition and fright; increased engagement and confidence level; promoted communicative activities to reach potential areas through internalization and transformation of new ideas; and helped them to attain the ability to orient their communicative choices and consciously apply grammatical concepts to attain

inclusive competence in second language development. The study requires further research to do with more students focusing other grammatical components. These achievements require more effort by the students and teacher. The importance and significance of annexation of co-curricular activities following transformative approach in experiencing and assessing grammar competence give a new vision to learners and teachers in EFL context.

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Utilizing U.S. TESOL Undergraduate Internship Students to Improve Japanese College Students' English Skills and the TESOL Students' Teaching Skills

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The IAFOR International Conference on Education – Hawaii 2020
Official Conference Proceedings

Abstract

The purpose of this presentation is to demonstrate how utilizing U.S. TESOL undergraduate internship students can help improve Japanese college students' English skills effectively in an EFL environment while simultaneously developing the interns' teaching skills. The internship students spend about six weeks at Konan University in the spring semester. During that time they are involved in teaching, co-teaching, observing, tutoring, lesson planning, and having individual conferences for a total of more than 120 hours. The biggest benefit that interns provide to our students is an increased amount of opportunities to communicate in English both in the classroom as well as outside of it through tutoring. The presenter will give detailed information about how he usually recruits interns, organizes their teaching schedules for different classes, and how each instructor supervises them. Furthermore, he will talk about student survey results that show how they felt about their interns and how interacting with the interns has helped improve their language skills. The presenter will also explain how the interns' experience at Konan will help them prepare for their teaching at any institution in the States and overseas in the future.

Keywords: TESOL, EFL, Internship

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Introduction

In the beginning of 2014 I received an email from a BYU (Brigham Young University) Hawaii TESOL undergraduate student asking me to accept a student teaching internship at Konan University in Kobe, Japan, where I am employed as an EFL professor. The internship is a credit bearing course at BYU Hawaii, and is required for graduation. Since I'm a BYU Hawaii alumnus, I invited him to come to our EIC (English Intensive Course) classes to teach, co-teach, observe and tutor for six weeks during the spring semester. Since then one BYU Hawaii TESOL student came to Konan until 2018. In 2019, three interns came in the spring and one intern came in the fall semester for five to six weeks.

The purpose of this presentation is to demonstrate how utilizing U.S. TESOL undergraduate internship students can help improve Japanese college students' English skills effectively in an EFL environment, as well as help develop the interns' teaching skills. Numadate and Stephens (2016) indicate that having an intern in EFL classrooms and outside of the class helps Japanese students gain confidence in speaking English, motivates them to use the language, and actively engage in classrooms. Regarding the internship, Hurst, Thye, and Wise (2014, p. 58) state, "Internships provide one of the best ways for students to attain that work experience, refine their professional development and career preparation skills, and become a more marketable candidate."

Konan University EIC (English Intensive Course) students

In 2006 Konan University established the EIC (English Intensive Course) for freshman students who would like to improve their English and later study abroad in their sophomore or junior year for up to one academic year. The course enrollment started with less than a hundred students. In the year 2019 the enrollment increased to 240. In the beginning of their freshman year all students are expected to take the TOEFL ITP, and their average score is around 430 which is a low intermediate level.

The EIC curriculum focuses on linguistic competences such as speaking, listening, reading, and writing skills in the freshman year. In the sophomore year, the subjects are geared toward more academic skills and content-based learning. Freshman students take four ninety-minute English classes (meeting twice a week for each class) in one academic year instead of taking two ninety-minute English classes a year as in the regular freshman curriculum at Konan. In the sophomore year, students take two or three additional English classes and they can also sign up for additional elective courses such as TOEIC and Career English, according to their needs.

In addition to this curriculum, the EIC offers non-credit-bearing, seven-day TOEFL courses in the summer and spring intersessions. Students attend the intersession course for three ninety-minute classes every day for six days and take the TOEFL test on the last day.

Internship Procedure

Almost every year BYU Hawaii students send me an email with a resume. Then I request students to send me a letter of recommendation from one of the BYU faculty

members. After going through the resume and the reference with my coworker, we make a final decision to choose an intern. Then I write a letter of acceptance to the student's supervising instructor explaining that I'll be an experience provider and guarantee more than 120 hours in the internship including teaching, co-teaching, observing, tutoring, lesson planning, and having individual conferences.

Before coming to Konan University, prospective interns often ask me questions regarding internship duties, classes, housing and students. As soon as the decision is made to recruit an intern and the schedule is set, I contact several EIC teachers to get permission to accept the intern in their classes. Then I complete the intern's schedule for classes and tutoring (see the Appendix A for the intern's schedule). Meanwhile, in my class I'll make an announcement to my students about the intern's schedule at Konan and show them a photo and a part of their resume. Students are also informed that they have opportunities to have a tutoring session every week, and they are encouraged to participate to practice their English. During the class, students sign up for the torturing sign-up sheet (see Appendix B).

A few weeks before the intern's arrival, I inform him or her about their housing (homestay) and what time I will pick them up at the airport. I also make transportation arrangements to take him or her to their host family. Most previous interns had never come to Japan and did not speak the language. However, they usually made a smooth transition to living and working as an intern at Konan. The transportation including airfare and some living expenses are paid by BYU scholarship. The intern arrives on Saturday and make an adjustment for time difference until Sunday.

Upon arrival on campus on Monday, I give an orientation for a couple of hours conducting a campus tour, taking them to classrooms, meeting all the teachers, explaining about my own class and answering questions regarding students and living in Japan. As you can see the intern's sample schedule in the Appendix A, they are usually busy as they need to be in school for six to seven hours every day.

TESOL 399R (2 credits)

BYU Hawaii TESOL students who are taking the internship course, TESOL 399R by Dr. Neil J. Anderson have the following requirements:

1. complete a total of 120 hours of experience within an educational setting,
2. submit five lesson plans that you have used during the internship,
3. submit two observation reports,
4. submit a final written report, and
5. participate in an Internship Report Night on campus (typically in Fall semester sponsored by TESOL Society)

Observing, Co-teaching and Teaching

Since everything is very new to interns, I usually ask them to simply observe my classes for the first day. I may ask them to join students' discussions every once in a while. Other than that, I ask them to get a feel for the atmosphere of the class, the students' levels, and recognize how a text is used in class. Meanwhile, I ask students to write their first name on a big piece of paper and place it right in front of them so

that our intern can memorize each student's name. In my reading class, I use an intermediate reading skills book called *Active Skills for Reading Book 3*, in which the text consists of pre-reading discussions, reading skills, a reading passage, a vocabulary activity and post reading discussions. From the second class I give interns an assignment such as prepare a pre-reading activity or vocabulary exercise for 15 to 20 minuets to see how they perform in class. Then I gradually increase their time to teach in my class. After their each performance, I take time to review their teaching. For example, I ask questions such as "What did you think about your own teaching?" and "Is there any room for improvement?" to see how they reflect their own performance. I also add a few other things that interns need to be aware of in order to improve their own teachings in the future. This reflective time is important for them to think about how they can apply principles of teaching they have learned in their TESOL classes more effectively in actual EFL classrooms. When giving them each assignment, I simply ask them to prepare for a certain section of the text, but I never tell them to prepare using a certain methodology or technique. They take responsibility of handling each activity in their own creative ways. In other classes, most teachers do the same thing, and some teachers even ask interns to be responsible for teaching the entire 90-minute class alone toward the end of their internship. In a few weeks, BYU Hawaii interns can adapt their teachings in Japanese college classrooms and develop their teaching skills. They become more independent as they feel confident in their own teachings. One of the interns indicates the following:

> Interning at Konan University was the best choice I could've made in internships for TESOL. The school provided a great opportunity to observe, interact, and teach in multiple ESL classroom/tutoring settings. In addition, because the English teacher pool is quite diverse--with Japanese, Australian, American, and English--it allows you to see various pedagogical implications be used in a united effort to achieve the same goal. As an aspiring ESL teacher, this was invigorating to witness/experience. Above all else, it is easy to care and love the people there (especially the students and teachers). Mr. Tsuda helped a great deal to ensure my transition into the school was smooth and heartening. In fact, the teachers were always eager to answer my questions and share their knowledge of ESL teaching based on their experiences and studies. Because of them, I believe I could improve my teaching significantly during this short time. If you ever have the opportunity to intern at Konan University, then I would encourage you to go. There are only positive things to be said and done there.

According to Batey and Lupi (2012, p. 41), the University of North Florida had sent their students to schools in Plymouth, England from 2008 to 2012 as a student teaching internship, and they found that participants "were able to meet the challenges with Emotional, Resistance, Flexibility and Openness, Perceptual Acuity, and Personal Autonomy." Just like our intern's testimonial, they had very positive experiences in their internship.

Summer intersession Class

In addition to teaching regular classes, one intern stays until the beginning of August to teach a seven-day intersession class geared toward a Disney World internship in Florida. We started this internship program in 2017 and every year a few students apply for the program. In 2018, BYU Hawaii changed the schedule for the academic

year. Before then interns came around the middle of June and stayed until the end of July. However, in 2018 the intern couldn't come until the end of June, and our semester ended in July. Therefore, we weren't able to accommodate a six-week internship. Instead, I created a one-week intersession where our students study 4.5 hours each day from the intern as a non-credit bearing course. In 2018 six students signed up for this class. Five students applied for the Disney Internship and four students passed the interview from a Disney recruiter. In 2019, five students signed up for the course. Three students applied and two passed and one is still waiting for the final interview. All the students who participated in the intersession said that this course was very helpful to prepare for the interview and improve their speaking skills. I oversee the intersession, but basically the interns usually start from scratch to think about the curriculum and lesson plans all by themselves. They are usually given preparation time during the final exam week toward the end of July for one week. It is a great opportunity for them to develop their teaching skills as they need to create their own lesson plans independently.

Tutoring

In addition to co-teaching and teaching independently, all interns are expected to work on tutoring students for almost 18 hours a week. Since our class time is 90 minutes, we divided the tutoring in half of the class, 40 minutes and a 10-minute break. The maximum of four students can participate in one tutoring session. Since this year, however, we changed the maximum participants for each slot is three so that our students have more opportunities to talk to our interns. This tutoring is mainly helping students to develop their communication skills and interns usually come up with their own questions to ask students. However, often times interns may run out of discussion questions and end up playing language games or other speaking activities with students.

Making a Presentation

All the interns are expected to make a 15-minute presentation in three different classes. The topic is usually given prior to their departure to Japan. The main purpose for this presentation is have our students become familiar with different cultures and have an opportunity to listen to a lecture and take notes. This helps them prepare for studying at a college overseas where they are supposed to listen to lectures and participate in discussions. In our classes while listening to a presentation, we ask our students to take notes about any interesting points they find and they work in pairs to talk about them after the lecture. Finally, they ask interns some questions. Interns usually make a PowerPoint presentation as a visual. For example one intern who was born in the States was raised in Hong Kong. He went back to the U.S. when he was a middle school struggling with English. He went to several different middle and high schools. Upon graduation he moved to Canada and Macau for a volunteer work for a couple of years and then he studied in Idaho and transferred to Hawaii. He talked about his high school experiences such as how he asked a girl out for the prom. He also showed us some photos of an outfit and a luxurious limousine. This experience was something new to our students, and they learned about American high school culture since we don't have such a fun event in our Japanese high schools.

Students' Surveys

Because four interns came to our university, it is worthwhile to conduct open-ended surveys this year in four different classes. Overall, students are very positive about interns' role as a teacher and a tutor. They expressed that interns are very helpful for improving their English, having an opportunity to use English outside of the class and learning about their cultures. Furthermore, unlike their teachers, interns are close to our students' age, so they find it easy to talk to. Some of their representative comments are : "I enjoyed your class!! I think I could improve my English skills because of you." "Your teaching was very exciting for me. Your English was clear and easy to understand. I love your tutoring too. It was fun!" "The class was a lot of fun. Your great passion for teaching helped me motivate to study hard." "Thanks to the interns, I was able to communicate with students from different countries. They have shown great examples. Because of them I want to become a more diligent student." "They always pay attention to listen to me. I'm happy to see that they're concerned about me." "Since I don't have many opportunities to talk to students from abroad, it was a great chance to talk to them." "I've increased my desire to study abroad because of them. They're very friendly and our age is close and easy to understand each other." "It was a rare opportunity to communicate with interns. I was able to increase my understanding about their countries and cultures."

Teachers' Evaluation

Until 2018 each individual teacher gave regular feedback to the interns. However, from 2018 I asked each teacher to give me their overall brief feedback toward the end of the internship, and I sent all the teachers' feedback to the interns. In this way, they can reflect on their internship experience at Konan University. Here is one example of an evaluation from one of the teachers:

> Sadie was present in my classroom for two 90-minute lessons per week between October 7th and November 15th, 2019, the class content being first-year English Presentation. In this period she assisted in planning some activities, and seemed especially interested in learning about how to instruct presentation structure activities. These activities were applied as warm-up and model activities. In terms of aptitude and attitude, Sadie proved herself to have an excellent ethical commitment, and displayed some solid understandings of foundational TESOL pedagogy. She was consistently polite, enthusiastic, and dedicated, and wrote and reviewed notes of her observations of each lesson and activity. I wish her all the best in her future studies.

Most teachers indicate that interns are very enthusiastic about improving their teaching skills and willing to help our students. It is a surprising fact that most interns make an adjustment to our culture in such a short time and can be an effective assistant to our teachers. In fact they play an active role in every class. Their experience is very different from interns in other universities in Japan. In one university they recruit American college students as an intern, but since their major is not in TESOL, their role in class is limited to give self-introductions, speak with students, give comments or ask questions to students who give their presentations (Numadate & Stephens, 2016). In another university interns' role is demonstrating speeches, giving feedback to students, participating discussions, and supporting

students' PowerPoint presentations (Bussinger 2013).

Conclusion

Having an internship is a very rewarding experience, as each intern comes to a new environment to learn about teaching in real classrooms. Perrin (2014) observes that this kind of experiential learning helps college students foster autonomy and accountability. Furthermore, Batey & Lupi (2012, p. 25) state that international internship opportunities "provide significant positive benefits by impacting a students' personal growth and maturity and further increase appreciation for diversity and language differences."

Kryssa, who is currently teaching at a middle school in Hawaii, reflects on her internship experience as follows:

> It's been over three years since I interned at Konan, and I still think about my time there often. At first I struggled with adjusting to a new culture, building rapport with the students, and coping with an unexpected death in the family. But as trying as it was at times, I absolutely loved it and am so grateful for the experience. The principles I both learned and observed from my leaders and co-workers helped me to grow as a teacher as well as a person. I know for a fact that I am a better teacher and a better person because of my time at Konan.

Teaching with interns is very beneficial for teachers and students as well. For example, since I'm a non-native speaker of English, I often ask the intern to pronounce vocabulary and have our students repeat after him or her. When it comes to teaching culture such as how to get a driver's license in America, the intern can elaborate his or her own experience. In addition, learning the language by two different "teachers" can be very stimulating to our students. Our students find a variety of teaching styles in one class fascinating, which in turn increases their motivation to learn the language. In my class this year two different interns came during the spring and another came during the fall semester. This meant we always had at least on intern on campus for a total of 18 weeks in the entire academic year. I could see that our students got used to speaking to them without hesitation and as the time went by, they were able to speak to them more smoothly and naturally. Numadate and Stephens (2016) found that interns in class and outside of the class help students increase their motivation, build their confidence, actively participate in the program and improve the language. Bussinger (2013, p. 9) also states, "Teachers felt that the student interns' contribution to classroom activities and classroom atmosphere in general was very conductive to effective language learning."

In conclusion, the internship at Konan University is very valuable for BYU Hawaii TESOL interns to gain knowledge and have practical teaching experience. In addition, our students have an increased amount of opportunities to improve their English while learning about other cultures. Some of our students still keep in touch with our former interns through social media such as Instagram. Given that this is such a unique program in a Japanese university and provides a tremendous benefit to both interns and students, we would like to continue this program to help BYU Hawaii students and Konan students to achieve their own goals in the future.

Acknowledgement

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Appendix A

Sadie's Weekly Schedule at Konan University

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1st			Intermediate Writing		Tutoring
2nd	Tutoring	Tutoring	Intermediate Presentation	Intermediate Writing	Tutoring
3rd	Tutoring	Tutoring	Tutoring	Tutoring	Tutoring
4th	Intermediate Writing	Intermediate Writing	Tutoring	Intermediate Presentation	Intermediate Writing
5th	Intermediate Writing	Tutoring		Tutoring	

1st period: 9:00-10:30 a.m.
2nd period: 10:40 a.m.-12:10 p.m.
lunch break: 12:10-1:00 p.m.
3rd period: 1:00-2:30 p.m.
4th period: 2:40-4:10 p.m.
5th period: 4:20-5:50 p.m.

Instructors:

Intermediate Writing: Nobuo Tsuda Monday 5th & Wednesday 1st Room 2-64
Intermediate Writing: Greg Sholdt Tuesday 4th & Thursday 2nd Room 2-31 (Tuesday)
Room 2-64 (Thursday)
Intermediate Presentation: Steve McNamara Wednesday 2nd & Thursday 4th
Room 11-208
Intermediate Presentation: Michael Griffiths Monday 4th & Friday 4th Room 3-36

Appendix B

Sadie's Tutoring Schedule

チューター予約表（11 月 11 日〜11 月 15 日）週 1 回のみ希望する時間帯に名前（ローマ字）を記入してください。参加できるのは、1 回最大 3 名まで　場所は 2 号館 1 階 Global Zone です。

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11 月 15 日（金）午前９時～９時４０分
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11 月 15 日（金）午前１０時４０分～１１時２０分
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Today's Choices for Selecting a School:
Public, Private, Charter Public, Charter Private, or Homeschools

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Abstract

Today, "equity" and "a quality education" are at the forefront of education conversations at the family dinner table, the local diner, and the editorial page of the newspaper. Why? Local and national efforts are increasing to meet students' needs academically and developmentally. Families strive to address their children's needs educationally through a relevant support system couched in a well-matched learning environment. With more choice in how schools are structured and how there is availability to consider different types of schools (e.g., charter, public, private), families and the general too have found voice through surveys and questionnaires about the choice of different school structures. This paper provides an overview of choice of schools available to families in the United States - public, private, charter public, charter private, or homeschools. This paper summarizes fundamental differences among various learning environments within these schools and learning settings to help families analyze what indeed is the best environmental match for each of their child's or children's learning needs.

Keywords: school choice, public schools, private and public charter schools, and homeschools

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Overview and Purpose of Paper

"Equity" and a "quality education" are at the forefront of conversations about school choice. Local and national efforts are increasing to meet the needs of individual students wherever they are and provide relevant support to overcome obstacles that may be preventing them from a fair chance at an education in a public school. Twenty-five percent of families are considering moving their children to another school based on better opportunities to hone strong skills for future employment (Great Schools, 2017; Harris Interactive Poll, 2009). Some critics of private schools believe that a private school experience removes the child from authentic real-life experiences. Some proponents of private schools believe that these schools provide more of a focused opportunity to learn a specific set of skills (e.g., Career and Technical Education) or talents (e.g., theatre). This paper is built on findings from multiple data sources to provide insights to help discern distinct characteristics about schools in the United States: public schools, private schools, charter public charter private, and homeschools. As part of the discussion two additional features of schools are addressed: single gender schools and religious-centered schools. This paper also presents an overview of the multiple variables that come into play when parents are deciding the school that is the best fit for each of their children.

Methodology

This paper is a research synthesis that provides a framework for analyzing and interpreting sources that capture a comprehensive analysis of a current topic (Leech & Onwuegbuzie, 2008). Data have also been gathered from informal interviews of families and administrators at various sites, observations at sites across the United States, and documents and publications from respective sites. Data were analyzed using content analysis and theme analysis to capture a broad understanding of school choices today. As part of the study, data that were also collected and included in the paper provide current findings from research articles, national and local data, and individuals involved in various learning choice settings. This multiple data approach helps provide more dimensions to capture the "roundedness" of each setting's characteristics, namely, education environments and curricula, that may assist local school districts in closing the achievement gap. In addition, subtle issues that families also explore such as equity, gender, socioeconomic level, and gender are explored through statistics data such as IES NCES, 2017; Niche, 2017, or Public School Review, 2018. In addition to star ratings that are now available as part of each school's rankings in terms of scoring on national exams, families are also finding first-person accounts from families in the area and local press on coverage of school events – both positive and negative. These data sources change yearly and this paper provides a brief overview on a complex issues that is constantly in flux.

Some Overall Distinctions Between Public Schools Vs. Private Schools

As a baseline, it is important to address the distinctions between public and private schools. Public schools do not charge tuition. Education ratings help create a rationale for purchasing a home in a high-star rated school as compared to a low-star rated school. Some families also use a rationale that splits the difference - electing to purchase a less expensive home to afford the tuition for a private school.

A second distinction is that public schools are funded by taxes – federal, state, and local - and are accountable for rules and regulations locally, state, and nationally. Private schools, on the other hand, generate their funding sources and many times, this funding is provided by tuition that ranges in cost from $10,841 at a minimum to $25,000 in exclusive private schools (Clearinghouse, 2015). Public schools accept all students and provide accommodations for special needs and gifted students. Private schools can add a clause in their admission standards that they do not provide services for students with special needs or those who need accommodations. There are ranges of other differences – class size, teacher preparation, and curriculum selection. Private schools have more choice in how they organize their classrooms and daily schedule, select their teaching staff and evaluate their curriculum outcome scores (IES NCES, 2017, Niche, 2017; Public School Review, 2016). Private schools, both elementary and secondary, are educational institutions that are not primarily supported by public funds (Digest of Educational Statistics, 2017). Typically, these schools are grouped by categories that are principally religious: Catholic, other religions, and nonsectarian (Digest of Education Statistics, 2017). Since 2015, where there were 5.8 million students in private schools, the population has been in flux (4.1 million in fall 2013 to 4.3 million students in fall 2015). (NCES.ed.gov, 2015). In a closer look at private schools, namely Catholic schools, there is a distinction in racial enrollment: White students constituted the largest share of enrollment in Catholic schools (66 percent), other religious (73 percent) and nonsectarian schools (6 percent) based on statistics in 2015. Black students made up the second-largest share of enrollment in other religious schools (11 percent), and Hispanic second-largest share of enrollment at Catholic schools (16 percent). A larger percental of students were Asian at nonsectarian schools (9 percent) than at Catholic and other religious schools (5 percent). Likewise, the percentage of students who were two or more races was larger at nonsectarian schools (6 percent) than at Catholic schools (4 percent). Pacific Islander and American Indian/Alaska Nation students constituted 1 percent or less of enrollment at Catholic, other religious and nonsectarian schools (nces.ed.gov/programs, 2019).

The Difference between Public Charter Schools vs. Charter Schools

In a more specific comparison – that is looking at public charter schools, as compared to charter schools - there are many similarities. Public charter schools are open to all children, do not charge tuition, and do not have a special entrance requirement (National Alliance for Public Charter Schools, 2017; Social Solutions, 2017). The first charter schools were started in 1992 in Minneapolis. In 2008, there were 1.29 million students enrolled in charter schools; by 2014, there were 2.57 illion students enrolled in public chater schools. Over 39 states have regulations for charter schools. Charter schools need to participate in testing and federal accountability programs, but tend to have more regulatory freedom and authnomy from state and local rules in terms of staffing curriculum choices and budget management (EPE, 2017). These schools are funded publically and typically follow governance by a group or organization under a legislation contact namely a charter with the state, school district, or other entity. The difference is that a public charter school has fewer state regulations and more potential for flexibility. It is important that the public charter school still needs to meet the accountability standards outlined in its charter and these are reviewed periodically to ensure that the charter is aligned with the practices at the public charter

school. If the guidelines are not followed or the standards are not met, the charter can be revoked (Abdul-Alim, 2016).

Another distinction is that charter schools have a charter approved typically by the state. Unlike a private school, a charter school depends upon money from the government to operate. In contrast to a private school, a charter school has less freedom to operate and make decisions. Both private and charter schools can receive accreditation and typically charter schools are more likely accredited than private schools (Social Solutions, 2017).

A Focus Look at Single-Gender Public Charter Schools

There are many examples of public charter schools which operate only boys' schools – such as the Urban Prep Academies in Chicago, or the Eagle Schools in New York – or only girls' schools, such as the Young Women's Leadership Network of schools in New York. Presently, middle school public charters make up the majority (47%) of schools in the United States followed by high school (34%) and lastly K-6 (28%). The single gender public schools that were open in 2003 have decreased. Most of the single gender charter public schools are located in large urban settings, for example, Capital Prep in the Bronx supported by rapper Puff Daddy, Eagle Academy Staten Island and Urban Prep D.C. The principal locations of single gender public schools are within the eastern United States, while the rest of single-gender public charter schools reside mostly in large urban areas surrounding Chicago, Cleveland, Miami, Dallas, and Houston. There "appear to be" zero all boys' public schools west of Texas. All but two schools (located in the southern states) serve a student population with more than 84 percent African American and Hispanic; sixteen schools are 98 percent diverse. Many students in these schools are on 100 percent free/reduced lunch (Authors, 2015).

Studies based on boys' and girls' performance in single-gender schools as compared to mixed gender schools shows that both groups showed modest advantages in their performance in mathematics but not for science (Pahlke, Hyde, Allison, 2014).   In a more recent study, Megan Murphy, executive director of the National Coalition of Girls' Schools (NCGS) has reported that single gender education has been shown to do wonders for many underserved girls. She adds that approximately 80 percent of graduating seniors from the Young Women's Leadership Schools are the first in their family to attend college (Murphy, 2017).

Homeschooling

Homeschools students are school-age children (ages 5-17) in a grade equivalent to at least kindergarten and not higher than 12th grade who receive instruction at home instead of a public or private school either all or most of the time. NCES (2019) reports that approximately 3 percent of the school-age population was homeschooled in the 2011-2012 school year.   Interesting enough, a higher percentage of those homeschools were White (83 percent) as compared to Black (5 percent), Hispanic (7 percent), and Asian or Pacific Islander (2 percent). A commonly held belief is that homeschooling means that the parent (or a designee) teaches the child in the home, providing whatever instruction is needed to educate the child. A clarification is that there are many alternatives including co-ops, enrichment classes, drop-off classes,

tutoring programs, dual enrollment, charter schools, satellite schools, courses offered by the public-school system in the home, on-line courses, homeschool umbrella organizations, homeschool programs connected to private academies, and correspondence courses. Many of these options take place elsewhere, with the teaching done by someone other than the parents. The parents still make the decisions and direct the instruction, but they do not necessarily do the teaching. The bulk of a student's learning may happen outside the home or at home in an atmosphere where learning can take place. Those who have embraced homeschooling report many benefits which include the ability to adjust each child's learning needs and the flexibility in setting up a learning schedule (Redford, Battle, & Bielick, 2017). Homeschooling allows the teacher to bring in the child's interest and talents and support learning needs. There is no set time limit in learning to master a concept or skill; a child can explore a topic more in-depth or take more time to learn about a concept that is difficult. A comprehensive study from 1998 through 2008 of 250 homeschool families in Pennsylvania noted that there were significant changes in homeschool programs. By the end of the study, programs were using a religious and non-religious curricula as well as school district textbooks and technology applications. Also, there were more collaborative sharing of resources and levels of expertise with school consultants and a more organized network of other homeschooling families (Hanna, 2012). Research on investigating issues related to equity and diversity related to homeschooling have brought in evidence that African American homeschoolers were able to gain a more comprehensive understanding of American History beyond the typical ethnocentric curriculum found in many public schools (Mazama & Lundy, 2013). There has also been a positive shift in the attitude that admission officers' attitudes toward and perceptions of the homeschooled graduates. More than 78% of surveyed admission officers indicated that they expect homeschool graduates to perform as well or to bet their first year of college as compared to traditional high school graduates (Lechner & Jones, 2013).   Perhaps, the most consistent negative press for homeschooling is that studies on homeschool outcomes – job preparation skills, civic engagement, or academic success – are not substantiated with research studies that have high response rates (Lubienski, Puckett, Brewer, & Jameson, 2013).

Shifts in Population Among Public Schools, Public Charter Schools, Charter Schools, Private Schools, and Homeschooling

Over the past two decades, the range of options that parents have for the education of their children has expanded. Private schools have been a traditional alternative to public school education, but there are now more options for parents to choose public charter schools or charter schools, and more parents are also homeschooling their children. Between fall 1999 and fall 2013, enrollment in private schools decreased from 6.0 million to 5.4 million, a decline of 0.6 million or 10 percent. During the same period, the percentage of elementary and secondary students enrolled in private schools declined from 11.4 percent to 9.7 percent (IES National Center for Educational Statistics, 2016). The percentage of all public-school students who attended public charter schools increased from 1 to 6 percent between fall 2000 and fall 2016. During this period, public charter school enrollment increased steadily from 0.4 million students in fall 2000 to 3 milion students in fall 2016- an overall increase of 2.6 million students. In contrast, the number of students attending traditional public schools increased by 1.3 million between fall 2000 and fall 2005

and then decreased by 0.6 million between fall 2005 and fall 2016, an increase of 0.7 million students. (National Center for Educational Statistics, 2019).

Also, there has been an increase in the percentage of 5- to 17-year-olds who are homeschooled. About 1.8 million children were homeschooled in 2012, compared to 0.9 million in 1999. The increase is also mirrored in the number of students who are in school, especially schools with a population larger than 300 students. Charter public schools increased by 1.8 million students, another statistic that helps showcase diverse school settings that have changed since 2004 (National Center for Educational Statistics, 2019).

Who Is Attending Schools – Ethnic and Socioeconomic Levels?

An interesting change in public charter schools that have emerged from 2004 to 2014 is that public charter schools are the response to the question, "Who is attending a public charter school?" (IES NCES, 2017) The population of students in public charter schools who are Hispanic increased from 22 percent to 31 percent, as did the percentage of students who were Asian/Pacific islander - from three to 4 percent. White students who attended public charter schools decreased from 42 to 34 percent. There was also a reduction for African-American students (from 31 to 27 percent) and American Indian/Alaska Native (from 2 to 1 percent). The percentage of students attending high-poverty schools (students who qualify for free or reduced lunch) was higher for public charter schools (35 percent) as contrasted with traditional public-school students (24 percent).

Family Choice in Selecting a School

Charter schools are the typical form of choice available to parents within the public education sector; however, some opportunity for parental choice also can be found in traditional public schools. In 2012, the parents of 37 percent of all 1st- through 12th-grade students indicated that public school choice was available to them. Also, in 2012, 13 per cent of students in traditional public schools were in a school chosen by their parents rather than an assigned school. There were differences in the characteristics of students attending their local assigned public schools in 2012 compared to those in public schools chosen by their parents. For example, White students made up a higher percentage of those in assigned schools (53 percent) than of those in chosen schools (40 percent). In contrast, African-American students made up a higher percentage of those in chosen schools (22 percent) than of those in assigned schools (14 percent). Hispanic students also made up a higher proportion of those in chosen schools (27 percent) than of those in assigned schools (23 percent). Students in cities made up a higher percentage of those in chosen schools (46 percent) than of those in assigned schools (25 percent). In contrast, students in rural areas made up a higher percentage of those in assigned schools (26 percent) than of those in chosen schools (14 percent) (IES NCES 2017). Compared with students in assigned public schools, a higher percentage of students in chosen public schools had parents who were very satisfied with some elements of their children's education in 2012. Among students in grades 3 through 12, the percentage of students whose parents were very happy with their school was higher for students in schools of choice (56 percent) than for students in assigned (public) schools (52 percent). Similarly, the percentage of students whose parents were very satisfied with their school's academic standards was

higher for students in chosen schools (59 percent) than for students in assigned schools (53 percent). Also, higher percentages of students in choice schools had parents who were very satisfied with school order and discipline (58 vs. 52 percent) as well as with staff interaction with parents (49 vs. 45 percent). However, there was no measurable difference between the percentages of students in choice and assigned public schools whose parents were highly satisfied with the teachers in their school (52 percent each) (IES NCES 2017).

Males and Females in Today's Schools

There continues to be a difference in the graduate rate of males in K-12 schools as compared to females. Although the national high school dropout rate for boys is half of what it was in 1985, it continues to trend downward; boys still have a higher high school dropout rate (7.2% in 2013) than females (6.3% in 2013) (IES NCES, 2017). One of the reasons is the lower level of aspiration for males to continue an education beyond high school. In the 1980s, although seniors of both genders had similar expectations about graduating from college and attending graduate school, girls already had higher aspirations (close to two percentage points) than boys. By the 2000s, the expectations index for both college and graduate school was eight percentage points higher for girls than boys. Gender differences in aspirations for college and graduate school are respectively eight percentage points and eleven percentage points greater in favor of girls. Six percent of boys versus 3 percent of girls have declared no postsecondary aspirations. This trend begins in among eighth graders, already 4 percent more girls than boys report being enrolled in a college preparatory program although a significant proportion of students (43 percent of both boys and girls) have not made clear choices yet.

The number of males graduating from college is roughly 10% less than females (NCES, 2017). This trend is even more evident when variables such as race and socioeconomic level are brought into the discussion. Males of African American and Hispanic backgrounds have a combined dropout rate of 20.8 percent, which has decreased by roughly 53 percent since 1985 due to national attention on racial inequity (Nelson, Stahl, & Wallace, 2015). Students from the lowest quartile family income have a dropout rate of 10 percent compared to 3.2 percent highest quartile (Center for Research on Education Outcomes, 2015; Dwyer, Hodson, & McCloud, 2013).

Data from "Monitoring the Future" surveys provide strong evidence that women now far outnumber men among recent college graduates in most industrialized countries (Vincent-Lancrin, 2008). Interestingly, women have not only overtaken men regarding college completion but also have overtaken them in educational attainment. Girls have shown these gender disparities in academic performance in secondary schools (twelfth and eighth grade over the last three decades (Fortin, Oreopoulos, & Phipps, 2015). The Fortin et al. study also explored issues related to gender over time that could account for the growing gender disparity in academic achievement. These include plans for the future, the family environment and working while in school. Among seniors, boys' expectations about attending higher education were lower as compared to expectations of females (Fortin, Orel Poulos, & Phipps, 2015).

Public vs. Private Schools. The percentage of public-school students who reported being victims of any offence (4.1 percent) was higher than that of private school students (1.8 percent) in the academic year 2008–09.

Race/Ethnicity. No measurable differences were found among the percentages of White, African-American, Hispanic students, and students of all other races who reported being the victims of any crime, theft, or violent crime at school in the academic year 2008–09. Among both White and Hispanic students, a higher percentage of students were victims of theft than of violent crime (2.9 percent vs. 1.2 percent for White students; and 3.0 percent vs. 1.3 percent for Hispanic students).

Grade Level. In the school year 2008–09, a higher percentage of students in grade 9 reported theft victimization (4.9 percent) than did students in grades 7 or 8 (2.1 % and 2.0 %, respectively). Also, higher percentages of students in grades 9, 10, and 11 reported theft victimization (4.9 percent, 3.5 percent, and 3.3 percent, respectively) than did students in grades 6 or 12 (1.3 % and 1.5 %, respectively). No measurable differences were found between the percentages of students in grades 6–11 who were victims of violent crime.

School size. Researchers at the National Center for Education Statistics (IES NCES, 2017) found that discipline problems are often related to school enrollment size. Large schools tend to yield more discipline problems than small schools. Thirty-four percent of schools with 1,000 or more students reported student disrespect for or assaults on teachers at least once per week, compared with 21 percent of those at schools with 500-999 students, 17 percent of those at schools with 300-499 students, and 14 percent of those at schools with less than 300 students.

Household Income. No measurable differences were found among family income levels and the percentages of students who reported being victims of any crime, theft, or violent crime at school in the academic year 2008–09.

Public vs. Private Schools and Grade Level. The percentage of public-school students who reported being victims of any crime (4.1 percent) was higher than that of private school students (1.8 percent) in the academic year 2008–09. Middle school students are more than twice as likely as high school students to be affected by school violence. Seven percent of eighth graders stay home at least once a month to avoid a bully. Twenty-two percent of urban 11- and 12-year-olds know at least one person their age in a gang. The typical victim of an attack or robbery at school is a male in the seventh grade who is assaulted by a boy his age. Studies suggest two reasons for the higher rates of middle school violence. First, early adolescence is a difficult age. Young teenagers are often physically hyperactive and have not learned acceptable social behavior. Second, many middle school students have come into contact for the first time with young people from different backgrounds and outlying neighborhoods.

Focus on Research Question for the Future

As the attention to supporting charter schools in the United States is now on the forefront of the new administration's agenda, it is important that researchers craft a design to look at this phenomenon. The following suggestions provided by the Center for Public Education (2017) help to set the compass. It is anticipated that others who

are considering the issue of school choice will add to this set of opened-ended questions. These are also guides for meaningful discussions that need to be explored in public and social setting – issues that help uncover bias, help to gather relevant data and form meaningful consensus in an open forum. The bottom line is that the focus needs to be on two essential outcomes - student achievement and success.

What are the ingredients that contribute to charter school success, public school success? To private school success? To homeschool success?

Do smaller class sizes, longer days, parent involvement, or freedom from collective bargaining and other regulations play a part?

Is there a difference between public charter schools and private charter schools?

What about the local school district role? What variables count most?

What is not an essential part of school success?

What effects do different governance models have on positive charter school outcomes? How do these effects compare to governance models that are inherent in public school settings?

What interaction exists between traditional and charter public schools?

Is there any evidence of shared ideas and information? Innovation?

Does the charter's authorizer affect the results?

What are charter schools' effects on local school districts regarding funding, governance, logistics, and accountability, or performance?

Where are you getting your information? Is it well-founded?

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Lessons from a Global Analysis of the UN Conventions on Children and Disability Rights

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Abstract

Among the 6.7 billion people in the world, there are 2.2 billion children, of which 1 billion live in poverty. This study looks at the rights of children with disabilities and how vulnerable populations can be protected. The UN (2009) identifies several obstacles to democracy, human rights, and the rule of law, including: "deepening poverty; threats to human security; the infringements of individual rights and impediments to the enjoyment of fundamental freedoms". The author used a cumulative logit model for ordinal responses, in particular proportional odds model, to look at whether states with a higher degree of democratization and a higher level of human development are less likely to ratify the United Nations Conventions on the Rights of the Child and on the Rights of Persons with Disabilities. The analysis finds statistically significant relationships for multiple variables. Here are selected general conclusions: (1) as the widest ratified human rights treaties, the CRC and CRPD have profound implications on understanding how the states' development and democratization impact how they sign and ratify treaties; (2) different indices have different effects on each of the conventions, without contradicting each other, meaning that governments perceive and treat Conventions distinctly; (3) the date of ratification, rather than the date of signature, is much more reflective of the state's democratization and development levels; and (4) the world is in need for a reconceptualization and recontextualization of children and disability policies, redefining concepts like equity, empowerment, social enterprise, and inclusive development to include these disempowered populations.

Keywords: policy, United Nations, Convention on the Rights of the Child (CRC), Convention on the Rights of the Child and on the Rights of Persons with Disabilities (CRPD), democracy, Human Development Index (HDI), ratification

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Introduction

Populations become vulnerable for a multitude of reasons, however, the continuity of this status and its subsequent marginalization effect are contingent upon a latticed infrastructure of economico-political and socio-cultural factors that make up the environment of our societies. The scope of this study is to investigate how states adopt human rights legislation and how democracy and human development influence state decisions regarding children and disability rights.

This study addresses the rights of children with disabilities through both the Convention on the Rights of the Child (CRC) and the Convention on the Rights of Persons with Disabilities (CRPD). These two treaties give a powerful perspective on the rights of the children with disabilities, both emphasizing the cumulative rights of this stratum in several Articles (art. 7 and 23 in the CRPD; and art. 2 and 23 in the CRC). They are protecting the vulnerable strata of population which reflect the workers, leaders, and innovators of tomorrow, who will ensure the sustainability of our world, an idea embedded in the Sustainable Development Goals set forth by the United Nations.

Because no other United Nation (UN) convention has been welcomed and accepted so quickly and enthusiastically as these two Conventions (LeBlanc, 1995), the case of these ratifications is one that can provide most complete data on the relationship between the degrees of democratization and development of a state on one hand, and, on the other hand, the probability and speed of treaty ratification. For example, the ratification of a potential convention on the rights of aging persons could be influenced by similar factors. This is why it is important to analyze the patterns of past ratifications.

The conclusions of this study might inform monitoring efforts of treaties, national and local laws, as well as program development for achieving the rights expressed in their texts. Researchers, teachers, parents, policy-makers, and the public may take steps to advocate for increased democracy and development to raise the quality of life of children with disabilities.

Further, human agency is organically encouraged in a democratic environment, where governance, accountability, stability, freedom, and individual differences are valued (Henkin et al., 2009).

Henkin also noted that repression is rarely analyzed using quantitative analyses, therefore, this study is meant to pioneer the way for more research on repression of vulnerable populations. No previous empirical work looked at how country development and democratization influence the country commitment patterns to protect the vulnerable. This manuscript is meant to fill this gap and pave the way for further research that may identify macro-level relationships between country characteristics and repression of vulnerable populations. The intended audience of this manuscript includes, but it is not limited to, sociologists, political scientists, teachers, researchers, parents, psychologists, social workers, policy makers, and rights activists.

Method

A regression analysis was run to find out the association between the degree of democracy (i.e., the six indices of the World Government Indicators - WGI) and development (Human Development Index - HDI) as independent variables, and, as the dependent variables, the time elapsed from the first signature of the CRC (1990) and CRPD (2006) to the time of specific-country signature and ratification (Wait Time for the Decision to Sign) and the time from the specific-country signature to that country's ratification (Wait Time to Ratification). The best model was statistically determined by a backward stepwise procedure of successive selection and elimination of the variables, providing the most relevant information for the correlation. A multiple logistic regression analysis was run to render critical p-values, through F-tests and t-tests of individual regression coefficients. The critical p-values indicate the strength of the relations between variables, in other words, if the values are above the chance level. The Wait Time variable is ordinal, hence an ordinal logit model (i.e., a proportional odd model) is used to further the analysis. The model fit was assessed by recording the R-squared. The data analysis was conducted in the R software.

Research questions

1. Were democratic and/or developed states more likely to sign each of the two conventions?
2. Were democratic and/or developed countries quicker to ratify each of the two conventions than non-democratic or developing countries?

Variables

The *independent variables* used were: (1) The Worldwide Governance Indicators (WGI), a group of six indices quantifying the degree of democratization of a country; and (2) the Human Development Index (HDI), which ranks countries by their level of human development.

WGI

Aggregated by the World Bank, WGI pertains to several aspects of democracy. The WGI are collected and calculated by the World Bank and the methodology for gathering data, aggregating, and analyzing it is published online as open source (see Kaufmann, Kraay, Mastruzzi, 2017). The governance indicators reflect the statistical compilation of responses on "the quality of governance given by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries, as reported by a number of survey institutes, think tanks, non-governmental organizations, and international organizations" (Kaufmann, Kraay & Mastruzzi, 2017). The particular column used in this analysis represents percentage rank (i.e., values from 0 to 100), where higher values correspond to better governance outcomes. The degree of democracy is expressed in six governance and democracy indicators (see Figure 1).

Voice and Accountability measures the extent to which people are allowed to participate in elections and express their will, to associate with one another, and to have access to true information (free media).

Political stability and absence of violence measures perceptions of whether the government is at risk of being overthrown and destabilized through unconstitutional or violent acts.

Government effectiveness refers to the extent of the quality of public and civil services and its dependence on political obligations, the quality of the policy development and enforcement, and the credibility of state's loyalty to implement such policies.

Regulatory quality measures perceptions of government ability to develop and implement policies that promote the private sector.

Rule of law measures perceptions of the confidence people have that the government enforces rules in society, especially the contract sanctity, title rights, police and the courts, and the probability of crime and violence.

Control of corruption refers to the magnitude to which public power is used for private gain, from small to important forms of corruption, as well as the monopoly of elites on state and private interests.

Figure 1. WGI Indicators

HDI

The aggregate HDI values are published online as open source (see UNDP, 2014, Indicator Tables HDI 2014.xls) and the values used were for the year of 2014, the closest to the year of the other sets of our data. The HDI is an aggregate that includes measurements of the developments in education, life expectancy, GDP per capita, gender empowerment and equity, representing a summary of "each country's achievement in attaining: a long and healthy life; access to knowledge; and a decent standard of living" (UNDP, 2017).

Wait Time

The *dependent variables* represent Wait Time: (1) the time expressed in years between the first signature for each Convention and the year of specific-country signature and ratification, called Wait Time for the Decision to Sign; and (2) the time from the specific-country signature to that country's ratification of each convention, called Wait Time to Ratification. The bulk of the ratifications and signatures for the CRC are from 1990 to 1996 and for the CRPD are from 2006 to 2012, with the rest of the data being considered statistical outliers. The response variable 'Wait Time' can obtain discrete values from 0 to 7 (see Table 1).

Sample, Coding, and Description of Indices

Coding: Signature, Ratification, Accession, and Succession

By signing an international convention, a state declares that it intends to become a party in the treaty without an obligation to ratify or adopt its content into law. Ratification implies a legal obligation for the ratifying state to apply the convention (HCCH, 2015). Ratification is an international act by which a state agrees to a certain

treaty, and in the case of human rights treaties, a depositary collects the ratifications of all states, which allows the state that seeks ratification the necessary time-frame to obtain a domestic approval and to adopt necessary legislation to enforce the new provisions provided by the treaty (UN Treaty Collection Overview, 2017; [Arts. 2 (1) (b), 14 (1) and 16, Vienna Convention on the Law of Treaties 1969]). As explained by the UN, accession has the same legal effect as ratification does, and it occurs after the treaty has entered into force (UN Treaty Collection Overview, 2017, [Arts.2 (1) (b) and 15, Vienna Convention on the Law of Treaties 1969]). Succession data is also treated as ratification because the states that gained independence succeeded by transferring their sovereignty to the new state and, hence, they transferred the responsibility for an international act, as committed by the predecessor state (Milanovic, 2009).

Country Reservations

Because each sovereign state has the right to accommodate the international law to the domestic law and favor the beliefs of its citizens and government, several states have expressed their reservation to various aspects of the Conventions. However, since country reservations refer to parts of the conventions and do not void or nullify the act of ratification, the expressed reservations do not affect the decision to include all data on ratifying countries.

Sample

The CRC entered into force on 2 September 1990. By April 7, 2017, out of 196 of world countries, the CRC has been signed by 140 (71.43%) and ratified by 196 (100%) (UN Treaty Collection Depositary, 2017). Each signatory was coded with a number from 0 to 14, indicating the number of years elapsed since the CRC entered into force and opened for signatures and ratifications until the year of 2004, the year data was published by the United Nations Human Rights Office of the High Commissioner (UNHROHR, 2017). The latest ratifications after 1996 represent outliers and have to be dropped from the analysis, remaining with a total number of countries N=178, occurring 1990-1996.

The CRPD was adopted on 13 December 2006 during the sixty-first session of the General Assembly by resolution A/RES/61/106 (CRPD, 2015). To date, out of world 196 countries, the CRPD has been signed by 160 (81.63%) and ratified by 174 (88.78%). Data on CRPD signature and ratification until 2012 was analyzed, yielding a 7 year data window (matching the CRC), with the rest being considered outliers. Signature and ratification data of a total number of 134 countries were included in the analysis (N=134). For both conventions, only countries with the following available data were included in the data set: (1) independent states; (2) signature data; (3) ratification data; (4) HDI value; and (5) WGI values.

Theoretical Perspectives

Vulnerability of Children with Disabilities

Many years after the two widest ratified international rights documents in the history of humankind entered into force (the CRC and CRPD) (Fields, 2003; Lauren, 2003),

the United Nations organization still finds that fighting vulnerability and decreasing dependency are the main solutions to be targeted to ensure human development progress (Bissell, 2017). Due to the inequality within the vulnerable sub-groups, and to the various factors that simultaneously impact individual people, the concept of 'vulnerability stratification' is needed, referring to how much potential harm certain strata are exposed to, and how fast they can recover and adapt to the environmental demands (AJMC, 2006). The Human Development Report launched on July 24, 2014 (UNDP, 2014) focuses specifically on reducing human vulnerabilities and building resilience, with 20th century thinkers such as Bill Gates and Stephen Hawking bringing their own insight onto the topics of vulnerability and empowerment.

In the year 2015, the Millennium Development Goals (MDGs) transitioned into the Sustainable Development Goals (SDGs). Five of the eight MDGs referred to the protection of children from abuse, exploitation, neglect and violence, with the remaining goals targeting some of the causes of disabilities (Sustainable Development, 2017).

This manuscript looks at the two large vulnerable populations on the planet: children and people with disabilities. Among the 7.32 billion people in the world (CIA, 2017), about 25.5% are children 0-14 years old, and 16.2% youth and young adults of 15-24 years old. International sources estimate that, worldwide, approximately 15% of people (one billion people) have at least one type of disability (World Bank/WHO, 2011).

It is established that disability is both a cause and a consequence of poverty, with about 80% of global population with disabilities living "in low-income countries and experience social and economic disadvantages and denial of rights" (WHO, 2010). The World Bank reports that 20% of the poorest people worldwide have some kind of disability. The countries with the greatest number of identified disabilities are also the poorest countries in the world and are at more risk of having future generations of youngsters being cheated of IQ points (Wines, 2006, p. 101). Poverty also takes its toll on people in the form of mental disabilities (WHO ECOSOC, 2009).

Children and people with disabilities are perceived as some of the most vulnerable segments of the world's population, and, hence, least threatening to governments. Thus, decisions regarding children's and disabled's rights are more clear cut and, in some cases, less political, when a legal document assigned to protect them is less likely to be controversial than other documents. However, it is possible that ratifying the CRC and CRPD could predict a state to be more likely to ratify another human rights treaty pertaining to a vulnerable segment of the population, such as the elderly.

Democracy, Development, and Human Rights

Belden Fields (2003) states that virtually all states have ratified one or more human rights agreements, appearing to agree that there is a common understanding of the concept of human rights. The UN was the first international organization that set the stage for creating a set of human rights rules for the world over 60 years ago, subsequently followed by other international organizations and NGOs. Among other things, the CRC and CRPD became the basis for developing participatory children

and people with disability rights, schooling and education rights, health, and protection from abuse.

In the Declaration on the Responsibilities of the Present Generations Towards Future Generations, UNESCO (1997) states in Article 1 that "The present generations have the responsibility of ensuring that the needs and interests of present and future generations are fully safeguarded." Sen (1999a, 1999b, 2000, & 2003), Vollmer and Ziegler (2009), and UNDP (2009) acknowledge that it is not only freedom to make choices in life, but also health, education, and income that allow human development.

Results

Preliminary analysis

The Wait Time before ratification response variable varies from 0 years to 7 years for both conventions (the remaining years rendering outliers) and the distributions are skewed to the right. The HDI and democratization indices are stable over a long period of time (8 years for the democratization variables and 14 years for HDI). For the first 7 years after both conventions were opened for ratification, approximately 90% of the world sovereign countries ratified them. This means that the relationship between the democratization indices and the ratification of the conventions do not vary too much even after our cut-off point in time (see table 1).

Table 1. Number of country ratifications per year

Year the convention was signed	0	1	2	3	4	5	6	7
Number of observations CRC (1990-1996)*	4	75	32	18	21	17	12	3
Number of observations CRPD (2006-2012)*	4	24	29	27	12	14	17	9

*Note: Ratifications before and after the years included herein are outliers.

The Logistic Regression Model

To test the first hypothesis, logistic regression is used, with the response variable Wait Time transformed to a binary 'Signed/Not Signed'. The countries which did not sign the ratification are assigned the value zero, while all others assigned a value of one. The logistic regression model has a linear form for the logit of probability of 'success' written as

$$logit\big[(\pi(\vec{x}))\big] = \log\left(\frac{\pi(\vec{x})}{1-\pi(\vec{x})}\right) = \vec{\beta}\vec{x}$$

Let $\vec{\beta}$ denote the vector of coefficients, $\vec{x}$ denote vector of explanatory variables, and let $\pi(\vec{x})$ denote probability that country signed the ratification for a given value of vector $\vec{x}$.

For the explanatory variable selection in the logistic model a *stepwise procedure* is used. On each step, the procedures consider whether any variable included in the model is or not effective to the F-test, and redundant variables are removed. The

procedure stops when no more additions or eliminations can be made and the model has the highest information criterion.

CRC. For the CRC, the final model for logistic regression is as follows:

$$logit\left[\left(\pi(\vec{x})\right)\right] = \beta_0 + \beta_1 I_1 + \beta_2 I_2 + \beta_3 I_5$$

Table 2. CRC: Effect of indicators on the decision to sign (the logit model for signature data as a binary variable)

	Estimate	Standard error	Significance level
(Intercept)	2.7142	0.1356	0.001
Voice and Accountability	-1.2239	0.2483	0.001
Political Stability & Absence of Violence	0.3839	0.2132	0.01
Rule of Law	1.0559	0.2638	0.001

The estimated coefficients are presented in table 2. The indices Voice and Accountability, Political Stability, and Rule of Law are significantly different from zero and determine the rate of increase or decrease of the S-shaped probability curve. The sign of the coefficient indicates whether the probabilities increase or decrease with the factor. The Voice and Accountability coefficient has a negative value. This supports the idea that countries with higher developed Voice and Accountability area are less likely to ratify the CRC. The Political Stability and Rule of Law coefficient has a positive value which can be interpreted as the countries with a stable situation and a more developed law system are more likely to sign a new document to ensure the rights of its citizens. All indices have a slight effect, which means that there should be a large difference in their values to make significant changes in probabilities, i.e., a small effect takes longer to make an impact. It is interesting to remark that in the binary logistic regression, the HDI variable is not significant. After checking all possible combinations of HDI and democratization factors, no significant impact of HDI in any model was found.

CRPD. For CRPD, the final model for logistic regression is as follows:

$$logit\left[\left(\pi(\vec{x})\right)\right] = \beta_0 + \beta_1 I_2 + \beta_2 I_4$$

The estimated coefficients are presented in table 3, where both indices Political Stability and Absence of Violence & Regulatory Quality are significantly different from zero and determine the rate of increase or decrease of the S-shaped probability curve. The Political Stability coefficient has a negative value, which means that countries with a higher value in this area are less likely to ratify the CRPD. The Regulatory Quality coefficient has a positive value. Both indices have a slight effect, which means that there should be large difference in their values to make significant change in probabilities. After checking all possible combinations of HDI and democratization factors, HDI was not found as significant in any model.

Table 3. CRPD: Effect of indicators on the decision to sign (the logit model for signature data as a binary variable)

	Estimate	Standard error	Significance level
(Intercept)	1.1180	0.1806	0.001
Political Stability & Absence of Violence	-0.6418	0.2422	0.01
Regulatory Quality	0.7397	0.2349	0.001

The Ordered Proportional Odds Model

To test the second hypothesis, the effect of explanatory variables on the Wait Time before ratification is considered and treated as a new variable. The ordered proportional odds model exploits an ordinal scale of the dependent variable Wait Time. The dependent variable Wait Time is organized in 9 groups (according to the number of years when ratification was signed after it was opened for signature). Zero means that the CRC was ratified within one year (see table 1).

$$logit[P(Y \leq j|x)] = \alpha_j + \vec{\beta}\vec{x} , \text{ where } j = \overline{1,9}$$

For CRPD, the dependent variable is organized in 7 groups:

$$logit[P(Y \leq j|x)] = \alpha_j + \vec{\beta}\vec{x} , \text{ where } j = \overline{1,7}$$

This model utilizes the idea of cumulative logistic model. It refers to a collapsed response scale for any fixed group j. The parameter *beta* describes the effect of the explanatory variable x in the model on the log odds of the response variable in the category j or bellow.

CRC

For CRC, the most informative model according to the stepwise procedure includes the Voice and Accountability, Political Stability & Absence of Violence, and Rule of Law indices. The estimated coefficients are presented in table 4.

Table 4. CRC: Effect of indicators on wait time to ratification (the proportional odds model)

	Estimate	Standard error	Significance level
Voice and Accountability	-1.0938	0.2192	0.001
Political Stability & Absence of Violence	0.0172	0.3833	0.05
Rule of Law	1.8541	0.4063	0.001
Control of Corruption	-0.8943	0.3457	0.05

All the variables are significant on a 5% significance level. Voice and Accountability is negatively associated with the time to ratification of CRC, thus, the countries with a higher level of Voice and Accountability tend to sign this document quicker than countries with a lower level. However, the countries with a higher level of Political Stability & Absence of Violence and Rule of Law tend to ratify the CRC later.

Another interesting question to explore is the relationship of HDI coefficient and Wait Time to CRC ratification. HDI is significant and positive, which supports the argument that countries with higher level of HDI tend to have a longer Wait Time to ratification. Also notice that the effects of Voice and Accountability and Rule of Law remain the same as in previous model without HDI (see table 5). Even though in the long run, the HDI level was not significant in the logistic model (i.e., it is not related to the country's decision to ratify or not the CRC), for countries which already decided to ratify the document, high HDI corresponds with longer Wait Time until ratification.

Table 5. CRC: Effects of indicators on wait time to ratification when HDI and democratization indices are included in the model (the proportional odds model)

	Estimate	Standard error	Significance level
Voice and Accountability	-1.1459	0.2152	0.001
Political Stability & Absence of Violence	0.3572	0.1818	0.1
Rule of Law	1.7632	0.4036	0.001
Control of Corruption	-0.9792	0.3457	0.05
HDI	1.8481	0.9724	0.1

CRPD

For CRPD, the most informative model according to the stepwise procedure includes the Regulatory Quality and Rule of Law indices. The estimated coefficients are presented in table 6.

Table 6. CRPD: Effects of indicators on wait time to ratification (the proportional odds model, when the time of ratification is in an integer format)

	Estimate	Standard error	Significance level
Regulatory Quality	-0.358	0.219	0.1
Rule of Law	0.3938	0.218	0.1

All the variables are significant on a 1% significance level. Regulatory Quality is negatively associated with the time to ratification of CRPD. Thus, the countries with a higher level of Regulatory Quality tend to sign this document quicker than countries with a lower level of it. However, the countries with a higher level of Rule of Law tend to ratify the CRPD later because these indices are positively associated with the Wait Time variable. This supports the argument that the less bureaucratic a country is, the faster it tends to ratify the CRPD, and that countries with a complex legislation and a history of law implementation tend to examine and contemplate the document longer. When HDI was included in the model, it resulted in no significant effect of HDI and the significance of all other factors did not change.

Discussion and Conclusions

The multilayered results of this study are displayed in table 7 and discussed per micro- and macro-categories.

Table 7. Summary of Results: A higher value of the significant Index will have various effects on signature and ratification processes

U.N. Convention	Significant Index	Effect on signature (Sign/ Not Sign)	Effect on waiting time to ratification
CRC	Voice and Accountability	*Less probable (less likely)*	*Quicker*
	Political Stability & Absence of Violence	No significant effect	*Longer*
	Rule of Law	*More probable*	*Longer*
	Control of Corruption	No significant effect	*Quicker*
	HDI	No significant effect	*Longer*
CRPD	Political Stability & Absence of Violence	*Less probable*	No significant effect
	Regulatory Quality	*More probable*	*Quicker*
	Rule of Law	No significant effect	*Longer*
	HDI	No significant effect	No significant effect

Effects on Variables

Different indices have different effects for each one of these conventions, without contradicting each other, but rather complementing each other. This confirms the fact that ratifying one human rights convention does not mean that a particular government is more likely to sign another international treaty. Due to distinctiveness of the very issues under negotiation, and due to differences in cultural and political values across countries, international policies will be adopted differently. Secondly, it means that democracy, as a supraindicator, is impacting how policies for children and people with disabilities are adopted. Thirdly, it also means that democratic and developed countries are not in a race for quick and irresponsible ratification of international documents, but they choose to proceed wisely.

Human Development Index. A higher value of the *HDI* is only slightly significant on the ratification of CRC, taking longer time to commit to its implementation, but it does not have any statistically significant effects on the other dependent variables. This means that the degree of development of a country impacts child but not disability policy adoption, and even then only to a small extent.

Voice and Accountability. A higher degree of Voice and Accountability results in a less probable signature of the CRC, but a quick ratification. When the population is made aware of a new international document, it either lacks the systemic background and knowledge to interpret the legal jargon, or it misses the comprehensive intentions of the legal document. Novelty usually generates fear of unknown or unintended consequences, confusion, and dramatization. Debates over the issue can delay the signature of the convention until the government takes a position regarding the new document (David, 2002). In this sense, the democratic participation can both help and deter the triggering of a governmental decision to adopt a new piece of legislation. David (2002) further points out that under the CRC, the children are seen as active participants in society, pushing the state in adopting different types of measures and shifting from welfare to legally recognized rights. CRC has embedded civil provisions pertaining to participation, and distances itself from paternalism, requiring a change in

the belief systems of societies and institutions. The welfare of the dependents takes into account both the parent-child and state-family relationships, delaying the CRC ratification. However, once a government decision is taken, the ratification process tends to proceed relatively fast because the debates and legal motions have been already processed.

Political Stability and Absence of Violence. In a country with a higher degree of political stability, it is less probable for policies related to disabilities to be signed, and longer for children policies to be adopted into local legislation. When the government is fairly elected by the people and believed to represent the will of the people, then it less likely to be overthrown by acts of violence and, hence, the differences can be solved nonviolently. As such, longer debates and negotiations can take place to come to a consensus. Domestic as well as international costs need to be taken into consideration. For example, the fact that 69 states that have ratified the CRC mentioned declarations, reservations, and understandings, speaks to the amount of debate that states are going through before ratifying CRC (David, 2002).

Interestingly, the *Government Effectiveness* variable is not significant in either analysis. This means that signature and ratification of some human rights documents do not depend on the quality of public and civil services, as well as on the quality of the policy development and enforcement.

The *Regulatory Quality* variable has a statistical effect only on the CRPD, with a higher level of it determining a more probability to sign and a quicker time to ratify the document. This means that the degree of private sector development impacts the development and enforcement of policies in the favor of people with disabilities. This may be impacted by the fact that, in many developed countries, the hiring of people with disabilities by private companies, results in certain tax reductions for the companies.

Rule of Law refers to peoples' perceptions and confidence that the government enforces rules in society. This indicator is significant for both CRC and CRPD, in the similar ways. CRC is more probable to be signed but it takes longer to ratify. The signature of CRPD is not affected by this indicator, but, when it is higher, it takes longer for CRPD to be ratified. These results may have a couple of explanations. First, Nickel (2002) believes that the more experienced the country is with enforcing the law, the more likely is for that government to adopt a law that would ensure its people justice and the protection of the law. In democratic countries, the specifications of such an international human rights law are more likely to be welcomed because they support and complement the developing legal body. However, the international law may not be as specific as the domestic law even in a highly democratic country in regards to all legal, socio-cultural, and economical second-degree implications at the micro domestic level. A democratic system is usually highly bureaucratic and the decision needs to go through various subsystems (institutions) which ensure first the protection of all state citizens, and, second, that the new law is not in conflict with the domestic laws.

Second, when a state has already had in place a law similar to a new international law, there are two possibilities. One is for the international law to parallel the already existent domestic law, in which case ratifying of the new treaty would be redundant

and the government may not want to double the documents. The second possibility is for the new international law to be differently formulated and to even come partially in conflict with the domestic law, in which case domestic negotiations need to take place, ending with the government either not ratifying the document altogether, or ratifying it with reservations. In either case, the highly bureaucratic legal systems would require more time for legislative examination and approval.

The *Control of Corruption* quickens only the ratification of CRC, which means that the less predatory the political elites and other structures, the faster the adoption of child policies. In other words, children benefit when public power is not used for private gain.

Signature vs. Ratification

The most number of significant effects are on ratification, rather than on signature. This could be explained by the fact that the intention to become a party to the conventions does not have as greater consequences as the process of ratification does. Ratification has more political and legislative weight, requiring responsible consideration. Therefore, the date of ratification is much more reflective of the state's democratization and development levels.

CRC vs. CRPD and More vs. Less

The CRC is less probable to be signed when people have more freedom of expression, and there is an eagerness to sign it when the country has an established legislation system. The CRPD is less probable to be signed when there is more political stability and more probable to be signed when the private sector is developed. CRC is quicker to ratify in the presence of free speech and association, but longer to ratify when the government is more stable. The CRPD is ratified quicker when the private sector is favored by policies, but it takes longer to ratify it when a solid legislation is in place. The pattern of the results suggest that if a country signs early, then they are likely to take longer to negotiate the terms of ratification, and vice-versa.

General Conclusions

The conclusions of this study summarize as:
(a)   the rapidity and quantity of ratifications show that countries care about vulnerable populations and are ready to invest in creating opportunities for individual self-realization;
(b)   as the widest ratified human rights treaties, the CRC and CRPD have profound implications on understanding how the states' development and democratization impact how they sign and ratify treaties;
(c)   different indices have different effects on each of the conventions, without contradicting each other, meaning that governments perceive and treat Conventions distinctly;
(d)   the pattern of the results suggest that if a country signs early, then they are likely to take longer to negotiate the terms of ratification, and vice-versa;
(e)   the date of ratification, rather than the date of signature, is much more reflective of the state's democratization and development levels;
(f)   the country's law system is crucial to the adoption of children and

disability policies;

(g)   freedom of expression, country stability, absence of violence and corruption, and private sector policy advancement – all influence the adoption of local laws for the vulnerable;

(h)   judging by the number of statistically significant indicators, this research confirms to a certain extent one of Vreeland's (2008) and Neumayer's (2005) conclusions that the stronger the democracy and its civil society, the more respect for human rights;

(i)   this study confirms Donnelly's argument that "human rights thus can be seen as a self-fulfilling prophecy: 'Treat people like human beings (…) and you will get truly human beings'" (2003, p. 15);

(j)   although freedom from poverty is a human fundamental right that contributes to the harmonious development of human beings (Dhillon, 2011; Sustainable Development, 2017), a developed country is not rushing to sign or ratify international human rights documents;

(e) the world is in need for a reconceptualization and recontextualization of children and disability policies, redefining concepts like equity, empowerment, social enterprise, and inclusive development to include these disempowered populations;

(f) a set criteria for programmatic efforts for child and disability policy formulation is needed; and

(g) education and treatment for children with disabilities are public goods that would benefit indirectly the entire society.

Future research

Future research may include (1) running the data on CRC and CRPD protocols for signature and ratification and compare the results with the present study; (2) looking at what type of states (democratic vs. totalitarian) sign and how fast other UN treaties; (3) considering country socio-cultural factors as independent variables in adopting policies for the vulnerable; (4) finding relationships between CRC and CRPD ratification and specific sub-indices of the HDI (such as GDP per capita, gender empowerment, adult literacy, etc.); and (5) looking at possible relationships between CRC and CRPD ratification and the status of countries in their progress towards the SDGs.

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A Need to Support Teacher Diversity Through Culturally Relevant STEM Education at the Elementary School

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Abstract

There is an urgent need of modifications in traditional teacher education preparation programs in the United States that gears on preparing elementary teachers for culturally applicable science and mathematics curriculum. Such curriculum should focus on a) enrichment of the content and b) addressing the need of racially diverse students (Ladson Billings, 1995 & 1995; Menshah, 2010). This study investigates two female Indian teachers, engaged in teacher education preparation program in a tier one university at south east Texas. Purposive sampling was implemented to learn the perceptions of participants who are language learners themselves for this auto-ethnographic study. Participants are intensively engaged on a research to improve mathematics and science programs through the lens of culturally relevant practices for marginalized communities.

Keywords: Culturally relevant pedagogy, mathematics, science education, teacher education program, marginalized community

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Introduction

United States and European nations are persistently engaged in advocating the need of culturally relevant practices for diverse student population to achieve maximum student participation and engagement in STEM education. However, there exists a huge gap in preparing mathematics and science teachers who could implement culturally relevant practices for the diverse population in the United States (Menshah, 2010 & Sleeter, 2011). Students participation, from marginalized communities, in STEM courses depending on their family background, awareness of higher education courses, and assistance with preparation exams like SAT and ACT (Rawal & Decosta, 2019). This study argues that there are bright possibilities of increasing the marginalized students' participation in STEM through preparing teachers for culturally relevant practices from early grades, through lived experiences of two Indian teachers who are also doctoral candidates at a Southwestern university in Texas.

Theoretical Framework: Critical Pedagogy

In order to practice culturally relevant pedagogy, it is essential to learn how policies effect/affect student education even before practice. Culturally relevant pedagogy is based on Critical Theory and was developed by Freire (1968), who stated that education is an art of heart. Freire (1968) stated that critical pedagogy is a problem-solving activity by eliciting prior knowledge and developing it further in the problem-solving direction and in which teacher, society, and student have active roles. Freire (1968) viewed knowledge as critical awareness and did not believe in accumulating knowledge, he was not a believer of assessing knowledge by the number of pages read in a particular span of time, but creating and recreating knowledge as defined earlier. The only way to attain this is when students are a part of active learning by thinking and reflecting on a problem to suggest solutions for practice. This will bring in changes and reforms for betterment in the society in which they live.

Critical pedagogy integrates pedagogical knowledge, experiences, and policies that benefits urban minority students from a diverse background (Kincheloe, 2011, p. 2). Urban minority students refer to students coming from either a low socio-economic background, a linguistic background, a cultural or an ethnic background and all. Critical pedagogy is suitable for ELLs in an Urban Context as they have wonderful problem-solving abilities and requires a little scaffolding to exhibit their knowledge in their second language. As suggested by Freire (1968) critical pedagogy of questions are more appropriate for students, instead of pedagogy of responses, and classroom instruction should respect ELLs' knowledge. This alone could transform a teaching-learning experience promoting social reform.

Method

This study investigated two female Indian teachers, who are doctoral students now, engaged in teacher education in a Tier One University in the south east Texas. Purposive sampling was implemented to learn the perceptions of participants who are language learners themselves for this auto-ethnographic study. Auto-ethnography is appropriate for exploring personal experiences and connecting it to better understand cultural, social, and political meaning connected to personal experiences. Anu and

Nina come from a middle-class family and are first generation students in their family. They possess more than ten years of mathematics and science teaching experience respectively, in public and private schools in India. Both are engaged in doctoral research to improve mathematics and science teacher education programs through culturally relevant practices for marginalized communities in the south east Texas.

Results

Anu and Nina believe that culturally relevant education as the degree of aspect of understanding need for STEM education for all through the critical lens, when they identified the feel of lack of pedagogical and instructional praxis to make appropriate connections with the racially diverse students, during their doctoral teaching experiences (Boutte, Jackson, Johnson, 2010). Anu and Nina argue that the general perception that runs across with mathematics and science teachers that 'culturally relevant teaching' cannot be linked to mathematics or science education as these are mainly an inquiry-based education. Anu and Nina also identified that teachers are lesser prepared for teaching diverse students' population and fail to make relevant connections with the communities despite developing several classroom activities to engage their students on everyday basis (Bouette et al.,2010). Anu and Nina stated that White teachers often feel discomfort in addressing the concerns of students of ethnically minority groups as they are not fully aware about the minority cultural background, and they feared this can ultimately lead to rudiment teachers' relationship with their students (Murray-Johnson, 2019). Anu and Nina suggested that promote a stronger foundation in science for elementary level students, preparing teachers to teach core mathematics and science concepts by eliminating their biases mathematics and science as a predominate field of ethnically White or Asian students; promote *Science for All* and incorporating culturally rich experiences in to the class room; adopting the process of Enculturation (Herrera, Holmes & Kavimada, 2012)

Significance

On a typical school day of a mainstream classroom a student devotes less than an hour towards learning core mathematics and science concepts, which is not enough to sustain their interest in core learning of these subjects as they reach higher (Menshah, 2010). Insufficient exposure of content could be strengthened when mathematics and science education are grounded on culturally responsive curricula (Sleeter 2011). Culturally responsive pedagogy is not only about teaching but is also a political endeavor directed toward equity and justice" (Laughter & Adams, 2012).

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Design and Implementation of "SPOC Teaching Mode" for Fostering Creativity

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Abstract
SPOC (Small Private Online Course) has been widely used in higher education all over the world for its ease of access due to advanced information technology. Pursuing a successful future career, students in higher education need to develop their creativity and professional knowledge. Therefore, higher education should focus on the cultivation of creativity and professional knowledge through SPOC. This study aimed to establish a "SPOC Teaching Mode" for fostering students' creativity, by integrating online resources with classroom activities in order to develop a creative and professional education. The application of the mode is expected to stimulate students' engagements in autonomous learning activities, by practicing problem-finding and problem-solving skills, furthermore, facilitate students' professional knowledge learning as well as enhance their creativity in the professional field. Finally, a survey questionnaire was distributed to the participants in order to evaluate their views about the SPOC teaching mode.

Keywords: SPOC, Teaching mode, Creativity, Specialized knowledge, Higher education

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Introduction

Much attention has been given to creativity in education since 1950' (Craft,2001; Shaheen,2010). For a long time, creativity is considered as a vital ability for survival and career development. However, Jackson et al (2006) put forward a changed role of creativity, he referred that creativity used to be an advantage for few people, but now, it has become a necessity for humanity.

All the time researchers emphasize that creativity could be enhanced by learning (Davis & Rimm, 1985; Guilford, 1967; Karnes et al, 1961; Torrance, 1972). Guilford (1967) and Torrance (1963) found that creative thinking capacity could be enhanced by direct instructions. Karnes et al (1961) reported that educational design should be more flexible, such as enriched teaching programs and more reference materials. As Guilford (1967) claimed: "Like most behavior, the creative activity probably represents to some extent many learned skills. There may be limitations set on these skills by heredity, but I am convincing that through learnings one can extend the skills within those limitations." Then a certain number of training methods are developed to enhance individuals' creativity, such as brainstorming technique (Fryer,1996), thinking tools (De Bono,1987), etc. Admittedly, the arrival of the digital age is widely recognized as a new way to provide educators with more opportunities to carry on their teaching reforms. Hence, the integration of education and information technology elicited from the digital age is considered a careful intervention, which has a positive effect on enhancing creativity (Hargrove&Nietfeld, 2014; Bergmann&Sams, 2012).

In fact, SPOC has been widely used by educators from all over the world. For instance, Professor Fox at the University of California Berkeley successfully applied it to the "Cloud computing and software engineering" course in 2013. Similarly, Combéfis & Bibal (2014) successfully transferred the traditional course Informatics to MOOC by means of SPOC. There are hundreds of successful cases, and a big number of existing studies also provide evidence on SPOC's role in promoting students' capability.

Flipped classroom to foster creativity

Flipped classroom, also known as "inverted classroom"(Mason, Shuman & Cook, 2013), Bishop and Verleger (2013) defines flipped classroom as "a fresh pedagogical approach", it divides learning tasks into two parts, one part includes video lectures and other learning materials, the other part is group collaborations for solving problems in the classrooms. Many scholars have studied the impact of the flipped classroom on higher education, fortunately, more evidence support a positive influence (DeGrazia et al, 2012; Butt, 2014; Davies et al, 2013, etc.). For instance, DeGrazia et al (2012) found that students perform better in the traditional classroom, after the advanced preparations.

Design of the SPOC teaching mode

Theoretically, the flipped classroom may contribute to building the gap between theories and practice (Bergmann & Sam, 2012). Consequently, in this study, we are aimed to build up a blended teaching model, through the integration of online

teaching resources (SPOC) and classroom activities, with the purpose of enhancing creativity education and enriching professional education. we call this blended teaching mode the "SPOC teaching mode"(STM), and the application of the mode is expected to encourage students' autonomous learning in pre-class, and problem-finding and problem-solving techniques in class. Figure1 shows the SPOC teaching mode:
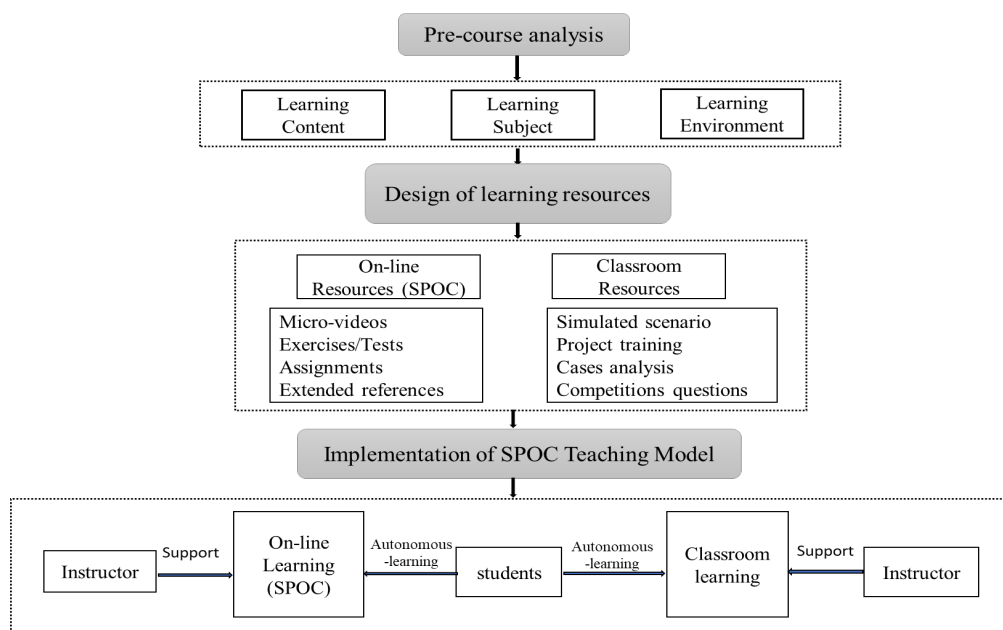
Figure 1: Design of SPOC Teaching Mode for fostering creativity

(1) Pre-course analysis

Before designing the SPOC teaching model, a pre-course analysis was conducted on the targeted learners. The analysis is mainly composed of three parts: analysis of the characteristics of students, analysis of learning content, and analysis of the learning environment.

(2) Design of teaching resources

Teaching resources are composed of on-line learning resources (SPOC) and classroom learning activities. On the one hand, on-line learning resources include micro-videos, exercises, tests, case analysis, and assignments. In addition, electronic books, syllabus, PPT presentation files could also be uploaded as extended resources for reference. On the other hand, classroom learning resources consist of case analysis, project practices, etc., and these tasks are accomplished by group collaborations.

Implementation of the SPOC Teaching Mode

The SPOC Teaching Mode was implemented in a Chinese University during the fall semester of 2019-2020, the targeted course is Principal of Accounting. This course is compulsory for all students enrolled in the School of Management; students typically take this course in the second grade. The course aims to provide students with basic

theories and skills for accounting booking, and which has a duration of 14 weeks. Each week, students are required to master one or two subjects.

Registration is required for students when enrolling in the course, and basic information of students will be recorded by the SPOC learning platform. We organized a series of learner-centered teaching activities, where instructors play a role of guidance. Task lists were designed according to teaching objectives and teaching progress. Learning tasks include watching micro-videos, case analysis, chapter practice, and tests. Every week, learning tasks were distributed to students on the platform, then students were required to utilize on-line resources autonomously. Specifically, we divided learning activities into two parts:

a. Pre-class activities: students were encouraged to view video lectures on the SPOC learning platform (Chaoxing Erya Learning Platform), which could help students to get an overall understanding of key conceptions and basic principal with ease. During this stage, students were responsible for their pre-class learning. After viewing videos, tests are followed, and students' responses were evaluated automatically by the platform function.

b. In-class activities: this part focuses on the training of problem-finding and problem-solving skills. These activities are designed to facilitate students' higher-order thinks skills. Students were divided into several small groups (typically 5 members in one group). In these smaller groups, they were assigned critical tasks extracted from the real corporate operation. In group collaborations, problem-finding, interactions, exchange of understanding and information, and problem-solving skills are encouraged.

Formative evaluation of summative evaluation

Critical thinking and creativity are formed during the process of learning and training. Therefore, the evaluation methods of the SPOC teaching mode should be diverse, in this respect, both formative and summative evaluation was applied in this mode. Specifically, on-line learning time, the accuracy of responses to the tests, active engagements in discussions were all taken into considerations. Secondly, after the completion of the course, a written exam was organized as a summative evaluation. However, unlike the traditional evaluation approach, the written exam merely takes a small part of the comprehensive score (30%).

Students' attitudes toward the SPOC Teaching Mode

When the course was finished, we designed a survey questionnaire by referring to AI-Zahrani' (2015) to investigate students' attitudes, in addition, necessary revisions were made to ensure that the questionnaire highly fit into our research objective. The reliability of the scale was examined using Cronbach's alpha coefficient. Table1 shows the results, the statistics indicate acceptable levels of internal consistency.

Subscale	No.of Items	Cronbach's Alpha
1 General views toward the SPOC Teaching Mode	11	0.969
2 The role of the SPOC Teaching Mode in the cultivation of creativity	9	0.988
3 Difficulties you faced in the SPOC Teaching Mode	7	0.959
Total	27	0.960

Table 1: Reliability statistics (n=30)

SPSS software was used to analyze the views of students toward the SPOC Teaching mode. The students' general views of the STM (the SPOC Teaching model) are illustrated in Table 2. The average score is 3.86 (the possible highest score for each question is 5). The highest score was given to item 8, and the lowest score was given to item 6, the scores of the rest items rank from 3.77 to 3.97, which show that students are upper-middle satisfied with the SPOC teaching mode.

When turning to the role of the STM in the cultivation of creativity, the mean scores of all items are shown in Table 3. The scores of sub-items are close, ranging from 3.80 to 3.9. The highest score was given to item 5, and the lowest one was found in the 4 and item 8.

We also found that students faced with difficulties with the SPOC teaching mode(M=3.16). For example, students need to spend more time on learning compared to the traditional lectures (M=3.33), in addition, it is reported that students were not prepared well to integrate on-line learning resources with classroom activities(M=3.33). The remaining items falls in the moderate range.

Items	M	SD
1 STM offers me the opportunity to review the teaching videos many times	3.97	0.89
2 STM helps me access to various learning resources	3.90	0.85
3 STM enriches my learning experience	3.90	0.85
4 STM helps me connect theoretical knowledge with practical activities	3.80	0.93
5 STM helps me collaborate with classmates and instructors	3.77	0.94
6 STM helps me establish more communications with teachers	3.63	0.89
7 STM helps me effectively participate in the learning activities	3.83	0.83
8 STM gives me the opportunity to arrange my own learning activities	4.07	0.83
9 STM helps me develop my problem-solving skills	3.90	0.85
10 Comparing to traditional teaching method, I prefer STM	3.77	0.94
11 STM promotes my personalized learning	3.93	0.87

Table 2: General views toward the STM （SPOC Teaching Mode)

Items	M	SD
1 STM helps me think differently	3.83	0.83
2 STM helps me generate more novelty ideas	3.83	0.83
3 STM helps me generate more ideas	3.87	0.86
4 STM helps me generate flexible and practical ideas	3.80	0.76
5 STM gives me the opportunity to discuss and evaluate new ideas	3.90	0.85
6 STM helps me think creatively about the causes and effects of problems	3.87	0.82
7 STM improves my ability to analyze information to generate new ideas	3.87	0.73
8 STM helps me analyze the problem's components and address them independently	3.80	0.85
9 STM helps me think creatively about how to solve problems	3.83	0.87

Table 3: The role of the STM in the cultivation of creativity

Items	M	SD
1. I was not prepared well to integrate on-line learning resources with classroom activities	3.33	0.92
2 STM required more work than traditional lectures	3.33	1.03
3 Online videos lectures and classroom activities were not prepared well	3.17	1.02
4 The teaching objective was not clear enough for me	3.13	0.97
5 I did not receive adequate feedback in classroom activities	3.10	1.00
6 I did not have adequate time to finish viewing the teaching videos and other assignments	3.27	0.98
7. It was difficult for me to use online learning tools	2.80	1.22

Table 4: Difficulties you faced in the STM

Discussion

Judging from the statistics of the survey questionnaire, generally, we found that students were satisfied with this mode (M=3.86). Furthermore, they reported that the STM can enhance their creative thinking (M=3.84). These results are consistent with prior research (Butt, 2014; Davies et al, 2013, etc.). This mode provides a suitable environment for thinking differently, generating new ideas, discussion, and analysis of information, thus, learners' creativity is effectively facilitated.

However, we also found participants faced with difficulties when attending the STM (M=3.16). For instance, students needed to spend more time on learning compared to other courses, thus, learners reported they did not have enough time. Secondly, students claimed that they did not get adequate feedback from classroom activities(M=3.1). Thirdly, online video lectures and classroom activities were not well prepared(M=3.17). These problems were also found by other studies in the flipped classroom (Strayer, 2012, etc.). Therefore, the learning load ought to be taken into consideration when a course is designed. Additionally, high quality and timely materials, effective classroom activities should be encouraged, too. Moreover, the feedback from instructors and group members should be strengthened.

Limitations and further research

The study was conducted under a certain context, higher education in China. Additionally, it concentrates on a specific course, namely, principles of accounting. Therefore, further research may focus on other courses. The teaching content and teaching objectives may have impact on the effectiveness of creativity education.

Conclusions

The SPOC teaching mode emphasizes on promoting students' self-learning and active engagements, it provides students with abundant learning resources, and appropriate classroom activities, which successfully construct a suitable environment for autonomous learning, interactions, and collaborations. Thus, it has a positive impact on students' creativity and professional knowledge.

Regarding the role of instructors, they are no longer the exporters of knowledge, they have become supporters of students' autonomous learning. Therefore, instructors' tasks have changed a lot, specifically, investigations of pre-class, the preparations of learning resources, instructions in classroom activities have become essential skills for instructors to successfully organize a course. That means not only students need to change themselves to get with this new teaching mode, but also instructors ought to undergo this change.

Acknowledgments

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Development and Validation of an Electronic Module in Linear Motion for First Year College Students of Iloilo City

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Abstract

This study aimed to develop and validate an electronic module in physics for first year college students of Iloilo and find out if there would be a significant difference in the performance of students before and after using the electronic module. The e-module was composed of one topic with two sub-lessons in linear motion (kinematics). The participants of the study were classified into three groups: the Subject Matter Experts who are physics instructors who suggested the content, physical appearance, and limitations of the e-module; the IT experts who are active both in teaching and developing computer programs; and 28 students divided into two groups, 15 in the pilot group and 13 in the final test group. A researcher created 30 items checklist form (difficulty of sample problem, comprehension, application and definition of terms) was prepared and validated by the experts in subject matter for gathering data. To test the difference in student performance in physics, the researcher prepared an achievement test containing 25 items, multiple choices. The findings revealed that there was an increase in the performance of students in the pretest and post-test. T-test results revealed that there was a significant difference in the test scores of the students before and after using the module which can be used as a future reference for linear motion as additional teaching tool in physics.

Keywords: Electronic module, kinematics, linear motion, physics

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Introduction

Physics occupies a unique position in the school curriculum of every institution. It is defined as the study of the properties, behavior, and interaction between matter and energy and natural phenomena; it investigates and formulates the fundamental laws of nature[1, 2]. According to Condonar, physics is a central core of physical science since it can relate to other sciences such as chemistry, ecology, and biology. In spite of the importance of physics to learners, student performance in both secondary and tertiary level has been poor [3, 4]. The desire to know the causes of students' poor performance in physics has been the focus of this study.

According to Lardizabal et.al, teaching methods and different teaching techniques affect the learning process and conventional teaching is not sufficient to make the student easily learn science concepts. Breitborde, and Swiniarski stated that the teacher sifts the subject matter and decides what is to be taught to students and the transfer of ideas from the teacher to student is done through a particular teaching method [5]. By means of teaching methods, the students are guided as to what parts of the subject matter are to be appreciated and what attitudes are needed to be developed [5]. Through it, the student acquires new knowledge, habits, rote associations, and skills. The teaching method guides the learning process of students [6, 7, 8].

Lardizabal et.al also stated that a teacher should make good use of teaching devices or materials. A device is a little method and a teaching aid or a tool to facilitate instruction that makes the teaching clearer, more meaningful, and more interesting. Pictures, flashcards, and technology like a computer are examples of devices [9, 10].

In this study, the researcher developed and used interactive modules that provided information in a multimedia fashion. The subject matter content of e module was validated by the Subject Matter Experts composed of Physics teachers and the content and faced validation was validated by IT experts.

During the entire process, the teacher assumed the role of a guide and the computer assumed the role of a platform [11]. A computer-assisted instruction was used to supplement conventional teaching resulted to higher achievement than using conventional instruction alone. Furthermore, using e-module promotes sequenced learning within groups can lead to more in-depth processing of course content and more retention of information and it is for the aforementioned reasons that this study was conducted, to develop and validate computer-assisted instruction to supplement physics instruction [12,13]. The computer-assisted instructional materials developed by the researcher was based on Robert Gagne's Nine Learning Events, Commission of Information and Communications Technology (CICT), together with the Bureau of Alternative Learning System (BALS), and SEAMEO INNOTECH [14].

The results of the study revealed that teaching with the use of the e-module can increase student understanding about the subject matter discussed by the teacher. It gives a clearer picture of how things work out. In addition, using computer-assisted instruction as a supplement to conventional teaching results in the development of skills that leads to mastery of the subject matter.

Theory

According to Lardizabal, in the educative process, there are three important factors involved: the learner, the teacher, and the subject matter. The teacher provides guidance to achieve proper learning and transmit knowledge and information through the subject matter. The teacher develops some teaching strategies and styles that can cope with the demands of the students to enable them to appreciate the subject matter. Through this method, the learner is guided as to what parts of the subject matter are to be appreciated and what attitudes are to be developed [8, 16].

Indeed, the classroom teacher is the key persons in the educational enterprise and directly involved in the instructional process in the classroom setting [9]. It also occupies strategic positions in the school system, for in their shoulders lie the responsibility of translating the curriculum into concrete learning experiences[10, 11]. Through the process of teaching and learning, the learners are given the opportunities to gain knowledge and understanding, develop habits and skills, acquire attitudes, and appreciate values [12].

Redesigning physics instruction in the 21st century must include not only what is taught but also the way it is taught. The use of technology and other modern equipment in order that physics teaching and learning are enjoyable and interesting to students resulting to be effective, innovative, and beneficial to the learners [17,18].

Using Electronic Module as Computer-assisted Instructional Material in Physics

Computer-assisted instruction has existed for decades, but it has not been widely used in education especially by schools resulting to low-quality education [19].The use of computer system in education opens more chances and opportunities for both teacher and students to develop good strategic plans in teaching and learning better the subject matter. In fact, today, every school teacher from elementary to college levels use computer-aided technology as a method that would help students learn the concepts easily. This method is called a computer- assisted instruction (CAI).According to Fernandez, CAI can teach biology, history, foreign language, mathematics, physics, and numerous other subjects and instruction supplemented by properly designed CAI is more effective than instruction without CAI [6,10,21]. Computer-assisted instruction can play an important role in classrooms and laboratory work, not as a substitute for other activities but as an additional tool.

According to Eggen, and Kauchak, learners retain new knowledge better when the curriculum was presented with a combination of formats of text, sound, graphics and video and using a computer as a method of instruction. Computer may be used to deliver instruction, reinforce practice, and provide feedback. It can also provide an individualized the learning environment in which students can learn or practice according to their own pace or the computer can be used as a remedy for students who lack the pre-requisite abilities to practice basic skills [16, 17].

In a typical electronic module system, each student sits in front of the computer. The computer presents instructions and lessons on the screen and through pre-recorded sound messages. A student responds by typing his answers on the keyboard or by using a mouse in marking and clicking the right answers [16]. The computer takes the

students through a lesson step by step to master the subject matter. The computer can drill, tutor, or carry on a dialogue in which the student's makeup problems and allows them to solve their problems [18, 19]. At the end of the lesson, the computer judges the student's performance and provide the feedback faster. Computer think faster than human beings, approach students more objectively, address different senses, and realize drudgery work more effectively [16,17].

Guidelines/ Criteria in the Preparations of an Instructional Module

According to Celis, an outline of a standard module has criteria that have a title that is brief, comprehensive, and interestingly stated. It has a purpose that is specific and has an overview that gives the students a birds-eye-view of the topic being covered by the module. It has objectives that are clear, comprehensible and formulated and its instruction are clear, simple and specific to the learner. The entry behavior and prerequisites skills should enable the learner to use it successfully. It provides a preliminary assessment of whether the module is within the learners' capacity or not. Pretest that is purposely given to determine the initial learning of the learner about the presented topics and pretest feedback that determine whether the answer is correct, a total score is counted that give the learner guidelines if he passes or fails. Posttest also included after the learners have done all the learning activities. Posttest feedback that just like the pre-test presents the total score of the students and improvement of the test score by the student is most likely to occur at the end of the module[8, 21].

There are 3 stages in the production of the modules according to SEAMEO INNOTECH. STAGE 1. Development of the self-instructional materials and production of the modules that have four stages namely: design, construction, validation, and revision. STAGE 2. Construction Stage. This involves the actual writing of the module and the construction of the post-test. Table of Specifications must be used as the basis for the construction of the achievement test. This includes the setting up of behavioral objectives, selection of teaching strategies, and construction of the illustrated sample problem in each lesson. STAGE 3. The Learning Activities for Each Module. These may be done individually or by group (if they are at the same pace) [20, 23].

Characteristics and Principles of Styles of Writing a Module as a Program Instruction

According to Arce, a clearer understanding of the programmed instruction is obtained from a description of the basic characteristics of programmed instruction that are focus, organized, complete packaged, and relates to student's needs. Program instruction is self-contained that student does not have to go to the teacher and ask what to do next or what materials he or she should use. It should be an individualized that reflects a logical and systematic flow of programmed instruction content with a definite beginning and end. Programmed instruction includes learning experiences and objectives. Experiences are provided to assist each student in mastering specified objectives as efficiently as possible [24]. A module should be readable that create a warm and friendly atmosphere. Using familiar words (be precise and specific in writing) and strong action verbs helps a lot. The writing should be plain, simple and direct [2, 20, 21].

Research Design and Methods

The development and validation of the e-module have two phases. The phase I which is the development of the electronic module and the validation by subject matter experts and phase II which is the validation of the Electronic Module by IT Experts and Try-Out Students. In Phase, I, the participants of the study was five physics instructors from three universities and colleges in Iloilo City. The subject matter experts were the ones who first validated the initial form of e-module through a checklist provided by the researcher. In Phase II, the participants were IT experts and students grouped into two, the pilot group and the final testing group. The IT experts were composed of five IT experts in different universities in Iloilo and Roxas City. They were the ones who rated the developed e-module through a different checklist prepared by the researcher. For the case of a pilot group of students, 15 students of Iloilo Doctors College and the University of Iloilo. They were the ones who tested if the developed e-module that had undergone validation of subject matter and IT experts could be ready for use by the students. Their performance in the achievement test would attest if the e-module was ready for final testing. For the final test group, 10 BS Marine Engineering students of St. Therese MTC College- Magdalo branch and one student each from West Visayas State University, University of the Philippines, and John B. Lacson Maritime University. Their performance in the pre-test and post-test would determine if the developed e-module was reliable for use and could help them improve their performance. Convenience sampling was used in assigning the participants to student groups for both the pilot and final test.

For Phase I, an initial draft for the electronic module was prepared as a modular instruction that supplements physics instruction. The preparation and development of the electronic module involved three stages. Stage I, the Planning Stage; Stage 2, the Development Stage, and Stage 3, the Revision and Evaluation Stage from the subject matter experts. To construct an electronic module, a power point presentation was made before it was presented to the graphics artist for graphic design and animation. It consisted of slides discussing the main topics which were linear motion and its two sub-lessons which were kinematical quantities for Lesson 1 and kinds of linear motion for Lesson 2. Each slide contained a number that started from the title of the module to the last lesson presented. The same number was used for the storyboard that provided the sequence of the topics including the title of the module. The storyboard was a set of pictures and illustrations which showed what would happen in the e-module. The programmer developed e-module from power point presentations to flash animation. A voice-over was inserted in the program for audio and video purposes that added attraction to the developed e-module. The lessons presented in the module were sequentially arranged, from a simple discussion to a more difficult lesson which was to be explained in a simple, clear, and interesting manner (Fig.1).

The Electronic Module Structure

Steps	Electronic Module
1	Title: The Moving World
2	Objectives
3	General Instructions
4	Introduction to Main Lesson
5	Introduction to Lesson 1
6	Pre-test
7	Start in Frame for Lesson 1 (kinematical quantities) and includes illustrated sample problem and advance animation for every topics)
8	Post-test for Lesson 1(includes student feedback)
9	Introduction to Lesson 2
10	Pre-test Lesson 2
11	Start in Frame for Lesson 2(Kinds of Linear Motion) and includes illustrated sample problem and advance animation for every topics)
12	Post-test for Lesson 2 (includes student feedback)

Figure 1. The general structure of electronic module in linear motion.

For Phase II, the materials used were the achievement test and the questionnaire-checklist. A 25 items multiple-choice test was administered at the beginning of the module after the objectives of the study were illustrated that underwent validation process based on Table of Specification and syllabus in physics of Iloilo Doctors' College, University of Iloilo, and St. Therese MTC College- Magdalo branch. The pre-test was incorporated at the beginning of every lesson and post-test was given at the end of every lesson inside the module. Two different checklists for two different groups of participants, namely; IT experts and students. It underwent a validation process by experts and to be used as an instrument for the evaluation by IT experts and students of the developed e-module. For Phase I (Validation Testing of the Research Material) the instruments needed were based on the survey form by the National Education Technology Standards (NETS) developed by the International Society for Technology in Education (ISTE) based on the book Integrating Technology into the Curriculum by Frei et. al. For Phase I, the researcher revised the survey form to fit from her own study. The questionnaire was given to subject matter experts for validation purposes. For Phase II, the instruments needed were the achievement test in linear motion and the questionnaire-checklist. For the achievement test, content and face validation of the test items were made possible with the help of physics professors. After long deliberation, 25 items out of 50 questions in the multiple-choice format were retained and included in the final draft of the electronic module for students' tests in each lesson. This test served as the pre-test of the e-module; the same test was used as the achievement post-test. However, the test items were arranged in a parallel manner but covering the same learning content. The pre-test had a reliability of .38, which was within the acceptable reliability coefficient level of 0.20-0.80 [28].

The questionnaire-checklist given to both the IT experts and students who underwent content and face validation by the subject matter experts.

Data - gathering Procedure

There are 3 stages in developing computer-assisted instruction of e-module. Stage 1 was the Planning Stage, Stage 2 was the Development Stage, and Stage 3 was the Revision and Evaluation Stage by Subject Matter Experts. For Phase I and Stage I which is the planning and preparation of the E - module. Using a course outline in physics instruction and consultations with five subject matter experts, an outline of computer-assisted instruction was made. Stage 2 which is the construction of the module. An initial draft of the module was prepared, completed and presented to subject matter and IT experts, for comments and suggestion. The first revised copies were submitted to the research adviser for comments and suggestions. The second revised copies were then submitted to the five subject matter content experts for content and face validation. The third copies were submitted to five IT experts for another review. The fourth revised copies were used by the researcher to the Pilot and Test group and to test their performance using the electronic module. The final copies were submitted to the members of the panel. The final form of the e-module was made after the suggestions, comments, and recommendations of the advisers, of the five subject matter content and five IT experts, students, and of the panel of professors were considered.

The E - module

The e-module in linear motion consisted of objective of the study used as guide in preparing the pre-test and posttest. The pre-test was validated by different evaluators who are experts in physics and teaching for more than five years. The researcher prepared a table of specifications and a checklist as a guide for test validation. Different questionnaires/ instruments were provided for both Phases I and Phase II. A checklist for the subject matter, IT experts, and student experts for validation of the developed e-module. The content of e-module, consisted of two lessons, the first lesson consisted of seven frames including the pretest and post-test; Lesson two had six frames, including the post- test. For Stage 3 which is an electronic module validation (Content and Face Validation) by the subject matter experts. The criteria for evaluation which were physical features, module objectives, instruction to the learners, learning activities, and evaluative measures. The panels members were asked to rate each lesson in the module as excellent, very good, good, fair, or poor. Comments from experts were also included in the instruments to serve as guides for the improvement of the e-module. In addition, the achievement tests included in the e-module underwent validation thru suggestions and rates of different valuators (Fig 2).
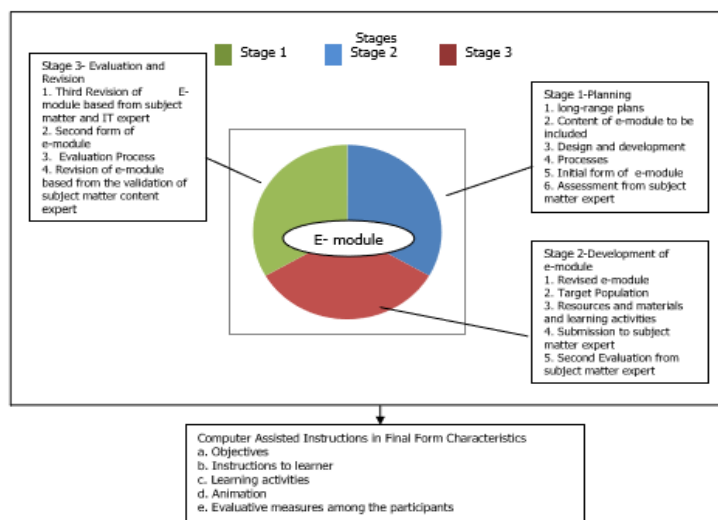
Figure 2. Development of E-module and Its Validation by Subject Matter Experts. Diagram is based on the Instructional Planning Cycle from the book entitled Teaching Strategies: A Guide to Effective Instruction by Orlich, et al., 2010.

After the approval by subject matter experts who validated the researcher instruments, permission letter was sent to every institution that is willingly participated in the study. Convenience sampling was used in choosing the respondents to test the validity of the develop module to improve students' performance and help supplement physics instruction. Then it went through the Phase II process which was the validation by IT experts and Try-out Students.

Phase II. Use of Instructional Module. Stage I which is the development of e – module. In this stage, the e-module was developed on the basis of the needs and diverse demands of physics students that underwent validation by three different groups of experts, namely: Subject Matter experts, IT experts, and a group of students who would help the researcher come up with a good electronic instructional material. This e- module would supplement the lesson in Linear Motion. Stage II the validation by subject matter experts, IT Experts and Students. Again, it was submitted to another five Subject Matter experts, IT experts and students for second validation. The Subject Matter experts were five professors and instructors who had more than five years in physics teaching. A program checklist was given to them as a guide for validation. The five Subject Matter experts were not members of the team that helped the researcher to develop the electronic module, while the IT experts were IT and Computer Software instructors who were active both in teaching and developing computer programs. Another set of program checklist was prepared as a guide for IT validation. The last validation was done by nine students who rated whether the developed electronic module was valid and suited to students as instructional material and supplementary lesson in Linear Motion. Students were given a program checklist as a guide for validation. Subject Matter Experts, IT experts, and the students were given sheets for their comments and suggestions. Comments and suggestions from three specialists were considered by the researcher as a guide for another revision of the electronic module. Stage III which is the revision of E – module which is according to the comments and suggestions of the three specialists. Stage IV is the try-Out among students were a certain topic was discussed by the instructor and with the use of the e-module. Lesson plan was prepared as a guide to make sure that the topic discussed by the teacher and e-module as enrichment lesson were the same. The

distribution of developed computer-assisted instructional(e-module) materials in the pilot group where a pre-test was included to assess the students' skills before reading the main lessons of e-module. A post-test was included to assess student's skills after reading the main lessons in the developed e-module. If the pilot testing would be successful, then the developed e-module would be conducted to the test group composed of students that would assess if it was reliable to improve student performance. Stage V is the revision of the e-module according to students' suggestions. A program-checklist was prepared for validation after reading the electronic material. Stage VI is the tryout of the effect of the electronic module on students' performance in physics using the Linear Motion Achievement Test (Fig 3).
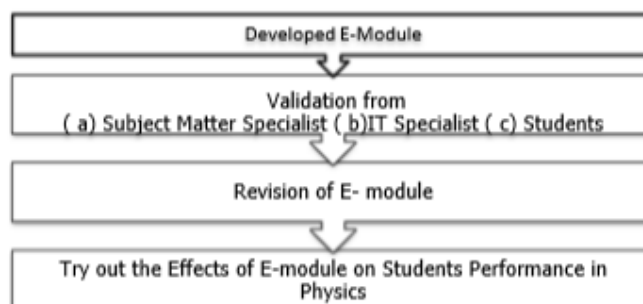
Figure 3. The Paradigm in Phase II is based on the theoretical framework of

Dr. Vilma Templora but the researcher did some revision to fit in her own study.

Permission to conduct the Validation of Electronic Module to the students was sent to every participating institutions. After the official request was granted, another letter of request for the subject teacher to conduct the pilot study on how the students perceived the developed electronic module was made. Convenience sampling was used in choosing the participants for both the pilot study and final testing. Checklists were used to measure the validity and students were instructed to rate the developed e-module.

The e-module was tried out among 28 students in six different colleges and universities of Iloilo City. Pilot testing was conducted to 15 first year students who had taken Physics 1 during the time where the study is conducted and they were instructed to use the e-module until the lesson was finished. Students answered the assessment directly to the e-module.

Since the results were good, the researcher decided to conduct final testing of the e-module among thirteen first year students of the participating institutions. The results from the final test group served as the basis for the usability of the e-module as instructional material to supplement physics instruction. (Fig.4)

(UI, St. Therese MTC College-Magdalo branch, IDC, JBLMU, WVSU,UP)

Scores in Pre-test and Post-test	Rating Scale
21-25	Excellent
16-20	Very good
11-15	Good
6-10	Fair
0-5	Poor

Figure 4. Rating scale used for pretest and posttest of student score.

The frequency was used to determine the ratings of the research material given by the subject experts and to interpret data gathered. It is also used to determine the pre-test and post-test scores of students in linear motion. The mean was used to describe the ratings done by the teachers on the research material and determine the level of achievement of the students in the pre-test and in the post-test. Standard deviation was used to show the dispersion of the scores from the mean. Percentage was used to ascertain the total number of respondents who agreed to accept every item included in the instruments given to evaluate the developed electronic module. In order to quantify the evaluation of the electronic module, the researcher assigned corresponding weights to each description to facilitate computation of the mean. Since every item was answerable by yes or no, the total percentage was translated according to scale and to its equivalent description (Fig 5).

Scale	Descriptive rating
100% - 80% - 5	Excellent
79% - 60% - 4	Very Good
59% - 40% - 3	Poor
39% - 20% - 2	Fair
19% - 0% - 1	Good

Figure 5. A constructed scale with the equivalent descriptions for interpretation purposes.

t-test for dependent samples was used to show whether there was a significant difference in the test scores of the students before and after using the modules; .05 alpha level was used as the level of significance to help determine the significant difference in the student's pre-test and posttest.

Results

Subject Matter Expert Validation

The subject matter experts rated the instructional electronic module "excellent" as shown in the overall obtained a mean of 5.0. In the actual rating percentage, every criterion was rated as "excellent" based on percentage equivalent given (Fig. 6)

Criterion	Actual Rating	Equivalent Rating	Description
1. General Program of the Module	80	5	Excellent
2. Objectives	88	5	Excellent
3. Content	90	5	Excellent
4. Appropriateness	88	5	Excellent
5. Motivational Aspect	87	5	Excellent
6. Appropriateness of the Assessment Strategies	80	5	Excellent
Average	85	5	Excellent

Percentage Equivalent	Scale	Descriptive rating
100% - 80%	5	Excellent
79% - 60%	4	Very Good
59% - 40%	3	Good
39% - 20%	2	Fair
19% - 0%	1	Poor

Figure 6. Overall rating results of subject matter expert's validation.

Information Technology Experts Validation

The IT experts rated the instructional electronic module as "excellent" with the over-all obtain mean of 5.0. With a total of five IT experts, four experts rated it as "excellent" with the obtained mean of 5 .0 and only one rated the instructional module as "very good" with the obtained mean of 4. (Fig.7)

Results of the IT Expert Validation

Criterion	Equivalent Rating	Description
1. Technical Quality	5	Excellent
2. Start up Implementation	5	Excellent
3. Graphics and Audio	5	Excellent
4. Simulations	4	Very good
5. Ease of Use	5	Excellent
Average	5	Excellent

Percentage Equivalent	Scale	Descriptive rating
100% - 80%	5	Excellent
79% - 60%	4	Very Good
59% - 40%	3	Good
39% - 20%	2	Fair
19% - 0%	1	Poor

Figure 7. Overall rating results of IT experts validation

Student Validation

Based on the student validation, students rated the whole instructional electronic module as "excellent" with the over-all obtain mean of 5.0. Thirteen students tried out the electronic module and were given an instrument to rate it. The electronic module draws positive reactions from the students based on the criteria for evaluating the module.

Criterion	Equivalent Rating	Description
1. General Program of the Module	5	Excellent
2. Objectives	5	Excellent
3. Content	5	Excellent
4. Appropriateness	5	Excellent
5. Motivational Aspect	5	Excellent
6. Appropriateness of Assessment Strategies	5	Excellent
7. Technical Quality	5	Excellent
8. Start-up and Implementation	5	Excellent
9. Graphics and Audio	5	Excellent
10. Simulations	5	Excellent
11. Ease of Use	5	Excellent
Average	5	Excellent

Percentage Equivalent	Scale	Descriptive rating
100% - 80%	5	Excellent
79% - 60%	4	Very Good
59% - 40%	3	Good
39% - 20%	2	Fair
19% - 0%	1	Poor

Figure 8. Overall rating results of student's validation

The final form of e-module is Entitled: "The Moving World" from the original title "Motion along the Straight Line". This module was prepared by the researcher and her team of experts which are validated by the Subject Matter and IT experts in different areas of physics and computer software and a group of students from the physics and IT program.
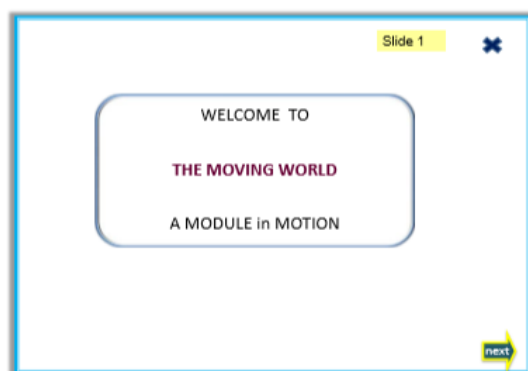
Figure 9. The final form of the module where the first frame is the title of the electronic module.

The program-checklists for the Subject Matter experts were validated by professors from universities and colleges in Roxas and Iloilo City. On the other hand, the IT expert's instruments were validated by professors in the colleges and universities in Iloilo City. Their comments and suggestions were considered until the final form of the program-checklist was made. The students' checklist was also validated by experts in their chosen fields in Iloilo City.

Based on the results of the initial pilot testing of the module, the pre-test mean score and the post-test mean score in Lessons 1 and 2, respectively, of 15 pilot students fell under the p-value of 0.000, meaning, there was a significant difference in the pre-test and post-test score of the students before and after exposure to the e-module. This evidence supports the content and construct validity of the e-module (Fig 10).

Pre-test and Post-test Pilot Testing Result on the Use of Electronic Module

Test	Mean Score	N	S.E.M.	t-value	P-value	Interpretation
Pre-test (L1)	12.20	15	2.68	-9.911	0.000	Significant
Post-test (L1)	18.93					
Pre-test (L2)	8.67	15	2.63	-9.668	0.000	Significant
Post-test (L2)	17.67					
Overall Impression	Lessons 1 and 2 of the e-module are effective as teaching tools. This finding supports both the content and construct validity of the module as a teaching tool.					

Figure 10. Pilot Testing results of students pretest and posttest

Based on the results of the final testing of the module, the pre-test mean score and the post-test mean scores in Lessons 1 and 2, respectively, of 13 students fell under the p-value of 0.000, meaning, there was a significant difference in the pre-test and post-test scores of students before and after exposure to the e-module. This evidence supports the content and construct validity of the e-module (Fig 11).

Pre-test and Post-test Final Testing Result on the Use of Electronic Module

Test	Mean Score	N	Std. Dev.	P-value	t-value	Interpretation
Pre-test (L1)	13.46	13	3.28	0.000	-8.605	Significant
Post-test (L1)	21.31					
Pre-test (L2)	14.62	13	3.48	0.000	-5.333	Significant
Post-test (L2)	19.77					
Overall Impression	Lessons 1 and 2 of the e-module are effective as a teaching tool. This finding supports both the content and construct validity of the module as a teaching tool.					

Figure 11. Final Pilot Testing results of students pretest and posttest

In this study, the electronic module as instructional material to supplement physics instruction was found to be "excellent" by all of the respondent users in the research study. It was also found out that the developed module is valid as instructional material to supplement physics instruction.

Conclusions

This is an instructional material development and quantitative study on modules in linear motion in physics for first-year college students. Results revealed that an instructional electronic module was personally developed, designed and constructed by the researcher to supplement physics instruction that was prepared, validated, revised, tried out, and administered by experts and students to determine its usability as instructional material. Based on the results of students' pre-test and post-test, develop an electronic module was found appropriate to supplement physics instruction. The average mean rating of subject matter experts as excellent was supported by the fact that the electronic module is a new teaching tool to help teachers make teaching and learning enjoyable and interesting for learners. The IT experts rated it also as "excellent", a significant indication that the e- module encourages instructional module developers to design an electronic module that helps teachers and students improve their individual performance in physics. Students rated the e-

module "excellent" and had a positive reaction to it. They find it amazing and enjoyable as a new teaching strategy wherein the lesson is presented in a modernized way since the e-module uses the flash animation program. There was a significant difference in the students' performance in physics after the use of the electronic module. The t-value results with a probability value below .000 was found, indicating that the post-test results increased at a statistically significant level ($p < .05$). There was a significant difference in the pre-test and post-test scores of the students before and after exposure to the e-module. This evidence supports the content and constructs the validity of the e-module.

The findings of this study support the fact that modular instruction helps supplement conventional classroom instruction and deserves greater consideration in the field of education to improve the teaching-learning process. Research findings revealed that the electronic module is valid for use inside the classroom by students who have different backgrounds and attitudes towards the subject matter like physics. E-Module is one of the solutions to the problem of physics instruction on the way lessons must be discussed to make them more fun and interesting to students enrolled in physics and may change these perceptions towards the subject.

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Language Learning Behind the Screen: Movies for Second Language Acquisition

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Abstract
Teaching English through movies, TV-shows, and video clips is a relatively modern way of enhancing language acquisition. The benefits of using American movies for improving students' English language proficiency have been studied by many researchers (e.g., Webb, 2011; Gormly, 2013; Lavaur & Bairstow, 2011; Etemadi, 2012) who supported the idea that, unlike traditional language instruction, authentic American TV-shows are able to target all major language aspects as a unit without separating each individual skill, thus increasing the effectiveness of language instruction. This paper explains the benefits of using video materials for English language instruction. It will cover the organizational process of implementing TV-shows into language learning course which includes (1) objectives, (2) relevance and appropriateness criteria, and (3) genre selection. The author will also introduce the principles of developing the course structure, which will consist of different types of pre-watching, while-watching, and post-watching activities. These principles and strategies form a comprehensive guideline to effectively implement TV-shows into second language instruction.

Keywords: second language acquisition, TV-shows, TV-series, course development

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Introduction

When learning a foreign language, it is hard to overestimate the importance of the authentic exposure to the language used in its intended cultural context with all the variety and diversity of cultures elements it comes with. As an English as a second language learner myself, I studied the language in my home country Ukraine, which is a non-English speaking country, and the limited exposure to authentic English complicated my language acquisition process.

While learning English in Ukraine, there were three crucial components offered by the multimedia content which provided me authentic exposure to the English language – music, videogames, and movies/TV-shows. When I listened to my favorite English songs, I wanted to know what they were about, so I looked for the lyrics and did my best to translate them using a dictionary. If I was lucky and there was already a translated version of that song on the internet, I would look at both English and Ukrainian versions, line to line, learning new words and idioms. I didn't have to force myself to memorize new words or grammatical constructions; I simply remembered my favorite songs to which I listened daily, and I easily memorized even advanced-level vocabulary. The songs also helped me understand the context in which I could use those words. In other words, songs gave me the intrinsic motivation to memorize words and grammar constructions that, if learned routinely in class, would be much harder to retain.

Similarly, when I was growing up, there were very few videogames that were translated into Ukrainian or Russian. To play adventure videogames, which is the type of videogames I liked most growing up, it was crucial to understand dialogues, names of objects and action verbs. Learning verbs like *give, pick up, push, pull, look at, talk to,* felt effortless because the knowledge would be constantly reinforced in games.

Even though both songs and videogames provide an important contextual component, songs are missing the visual component which often is representative of culture, and the visuals in videogames are often exaggerated and don't accurately represent the cultural context. Movies and TV-shows fill this gap, because, in addition to authentic language exposure, they also provide cultural contexts. Language and culture are inseparable, and language constitutes a large part of one's identity (Kucher, 2019). Learning to communicate in a different language requires more than knowing how to merely translate sentences, but also understanding "the values and representation the speakers of the language have of the world and how these speakers represent themselves in their cultural production" (Kramsch, 1998). Authentic video materials are one of the most effective media tools for communication among cultures. In no more than half a century, movies have dominated the lives of communities and changed many of their habits (Hafez, 2007).

Another benefit of using TV-shows is that they provide multisensory information about the language use in combination with learning about cultures, traditions, lifestyles, and beliefs, which transforms learning into a dynamic process. In traditional language programs skills are separated into classes – Reading, Writing, Listening, Speaking, and Grammar. Movies and TV-shows allow students to synthesize their knowledge and develop language skills more naturally as a complex unit without artificially isolating each skill. They deliver information about different

cultures, traditions, lifestyles, and beliefs, and are one of the most dynamic and accessible ways of learning any language.

In 2016 I facilitated the development of an English learning course based on the use of American TV-series which was added to the curriculum of one of the intensive English programs in Texas. I will explain the principles that guided me in the TV-show selection, and the strategies I used to develop the course structure including various types of activities and recommendations.

Movies Vs. TV-Shows

Movies and TV-shows both provide authentic environments for learning a language within its cultural contexts, however they differ in the ways they can be applied in classroom. I will briefly analyze movies and TV-shows from the perspectives of their affordances, limitations, and possible approaches.

Movies. King (2002) recommends *scene approach* and *whole film approach* when using movies for ESL instruction. In scene approach, teachers may show students one or several specific scenes or segments from the movie, but not the whole production. In whole film approach, teachers show students the movie scene-by-scene in a sequential order, making pauses between the segments for discussions or to check students' understanding. Teachers also pay show the movie in its entirety without making stops, and any activities or discussions will follow after the movie is finished. Selecting an appropriate approach depends on the teacher's objectives and targeted audience.

The strongest argument I make in favor of utilizing video materials in language instruction is that it allows students to synthesize their linguistic knowledge and to build contextual relation to socio-cultural elements presented on the screen. While scene approach is great for teaching vocabulary and grammar, it chops down movies into isolated scenes and strips them down of their large context. As a result, students receive very little information about the characters, relationships, storyline, and are unable to benefit from these contextual cultural elements that movies offer. Movies watched with a scene approach functions the same way as short audio and video clips included in many traditional listening and speaking textbooks.

Using whole-film approach resolves most of the issues with scene approach and allows students to immerse within the socio-cultural context presented on the screen as well as practice their language skills. However, watching a two-hour film is likely to cause cognitive overload in language learners, especially in beginning learners. That is why sequential approach with regular pauses to check students' understanding is recommended for whole-film approach so that a two-hour long movie can be viewed over the course of several class meetings. The challenge with this approach is that it might be harder for students to remember the details of the movie if the viewing is stretched over the week. The beginning of the film may fade away and meaningful discussion might occur only following the scenes that were watched the same day. It may be hard to elicit deep critical discussions about big ideas, overarching concepts, and promote analytical thinking, or discuss the whole movie plot in terms of its developmental points such as midpoint, climax, and resolution.

TV-Shows. Depending on whether teachers plan to use TV-shows once, several times, or every class during the semester, they may choose to watch a single show or multiple shows for language teaching. If teachers choose to use TV-series, they may decide to show the episodes sequentially or selectively, which means they may watch episodes one-by-one in a chronological order, or select the episodes that they find to be more suitable for language instruction. Selective episodes are recommended for TV-shows that introduce a new plot every episode (e.g. sitcoms), and sequential episodes are recommended for shows that have a bigger plot unwrapping with each consecutive episode and introducing new characters (e.g. thrillers, dramas, etc.). Choosing to watch only one TV-series during the semester will allow students to connect to the characters and understand their motives better, however using several TV-series will expose students to a wider variety of speaking styles, life situations, and cultural elements. Each has its benefits and teachers are encouraged to adapt their course structure and TV-series selection to specific objectives of the lessons.

Regardless of the storyline of the entire show, traditionally every episode of any TV-series has its own plot which can be discussed in terms of developmental points, problems, resolutions, characters' actions, cultural themes, etc. Because such episodes are normally between 20 and 40 minutes long, students may watch and discuss the entire episode during a single class, which places TV-shows for language learning in a slightly more advantageous position when compared to movies. In this paper, I will be referring only to TV-shows when discussing strategies for using video materials for second language acquisition.

Objectives and Structure

The first step in designing a program of study using TV-shows is deciding on the main objectives. Linguistic objectives, such as the development of listening, speaking, reading, writing, and vocabulary skills, are usually the initial objectives that educators have in mind when planning language lessons. However, TV-shows allow educators to target cultural and content-relative topics that otherwise would be hard to address in an effective and authentic way. Educators may choose to set as objective to analyze the socio-cultural climate showed on the screen, make connections to the students' home country experience, and critically evaluate the characters' decisions and actions.

Deciding on the structure of the implementation of TV-shows in the program is another important step. The implementation of video materials may occur on the levels of an isolated lesson plan, permanent part of a course, separate course, or the entire program with its own courses. I participated in designing a separate course which became a part of the official curriculum of the intensive English program. It was not a part of a Listening and Speaking class, but a separate course which focused on the comprehensive language skills development and cultural competence.

Criteria for Relevance and Appropriateness

Many professionals in the field addressed the importance of developing appropriateness criteria as guidelines for selecting the most relevant authentic video materials (Kwon, 2004; King, 2010; Rivera, 2015). Drawing from their work, I adapted the general classification of the relevance and appropriateness criteria which

included three groups – *basic criteria, linguistic criteria,* and *social-cultural* criteria. Table 1 shows a summary of these criteria.

Basic criteria include general guidelines for selecting video materials appropriate for language learning, such as high quality of video and sound, and a linear plot presentation with distinct development point (i.e. midpoint, climax, resolution, etc.). It is also important to make sure that the content in the video materials is age appropriate and generally relatable for the students, especially when reviewing dated TV-shows that represent ways of living and situations which are often much different from contemporary lifestyles.

Linguistic criteria cover language-specific requirements of an effective TV-show for language teaching. Based on the language level of target students, the teacher must critically evaluate the vocabulary complexity, pronunciation clarity, and speech pace dominating in the video materials. It is also preferred that the TV-show highlights predominantly the types of speech considered proper in the society. American TV-shows have the power to introduce different accents to the language learners which is a great advantage over traditional instructional models, however the amount of jargon and slang should be moderate to low.

Social-cultural criteria focus on the appropriateness of the content and social representation in the videos. TV-shows are praised for having the potential to increase the students' motivation to learn the language. That is why teachers needs to make sure that the content showed in the series is generally interesting for their age group and social status, and that it is presenting universal themes that all student can relate to regardless of their cultural backgrounds. It is also important that the TV-shows represent a generally positive social message, and that it is ethnically and culturally sensitive. There should be minimum no to representation of bias, stereotyping and discrimination on the screen unless it is a specific target of the movie as a social message.

Following these criteria is a great start for selecting the TV-show collection appropriate for language learners. Nevertheless, we cannot always predict the ways that the students might perceive certain cultural messages or themes. It is imperative to encourage students to speak up if any parts of the video make them feel uncomfortable, or if they find any aspects of the videos offensive. Such disclosure should ensure students that they have the power to address any issues that there might be with the video materials and that they will be resolved.

Basic	Linguistic	Social-Cultural
• Age appropriateness • Linear/sequential presentation • Good or high quality of video and sound • Well-written plot with distinct development points (midpoint, climax, resolution, etc.). • Generally relatable content (especially for dated movies/TV Shows)	• Vocabulary difficulty • Pronunciation clarity • Speech pace • Proper types of speech styles (colloquial, semi-formal, formal) • Variety of accents • Reasonable amount of jargon and cultural references • Considerable percentage of speech/dialogue.	• Universal themes and generally relatable content • Representation of generally positive social message • Minimal representation of bias, stereotyping and discrimination (unless targeted in the movie as a social message) • Ethnically/culturally sensitivity.

Table 1: Criteria for relevance and appropriateness of video materials used for ELT.
Adapted from Kwon, 2004.

Genre Selection

Selecting an appropriate genre for the TV-shows for ESL instruction is instrumental in achieving desired linguistic, cultural and other pedagogical goals. A well-designed organization of the genres according to the language learners' proficiency was developed by King (2010) and Rivera (2015). I adapted their suggestions to create the classification of   different genres of American television according to their levels of difficulty for understanding by English learners.

Beginning. Recommended TV-show genres for beginning learners are *sitcoms* and *romcoms*. These genres make a great choice for lower level speakers because they typically have simple plots and describe common situations that students can relate to even if they miss some verbal clues. Allowing beginning students an opportunity to guess the storyline based on visual cues is important to maintain their engagement and motivation and to avoid discouragement at the initial stages of the course introduction. Examples of TV-shows recommended in this genre are *Seinfeld, How I Met your Mother, Middle,* and *Everybody Loves Raymond.*

Intermediate. Intermediate language learners will benefit most from watching *drama* and *action* series. These genres are known for fast-moving storylines and the emphasis on human feelings and emotions. While students need to rely more on their language skills while watching these shows, the plots are traditionally built on universal themes like love, hate, friendship, family, trust, betrayal, and other feelings, emotions, and human relationships that all students can relate with regardless of the language they speak. Exemplary of this genre are *Gilmore Girls, Heroes, Lost,* and *Monk*.

Advanced. To present students with the highest challenge, *detective, crime,* and *sci-fi* TV-shows are recommended for advanced language learners. Understanding the plot twists of such video materials poses a difficult task and heavily relies on the knowledge of vocabulary, listening skills, and often cultural comprehension. Visual

clues are often unable to help viewers follow the narrative, and that is why such TV-shows make the best choice for advanced learners. A few examples include *Arrow, Breaking Bad, Mars,* and *Battlestar Galactica*.

Activities

As stated by Kucher (2019), three types of activities are necessary to effectively organize a lesson using TV-shows: *pre-watchin*g, *while-watching*, and *post-watching*.

Pre-Watching. The first step in planning a lesson is to design a pre-watching discussion about any cultural elements or plot points that might be unclear or confusing for the learners. Students feel more confident and eager to watch the show if they know the initial information about the main characters and the general themes present in the episode.

One example of successfully using a warm-up discussion is when I developed a lesson on the first episode of the TV-show called *Gilmore Girls*. In this episode, a single mother Lorelei Gilmore's daughter gets accepted to a prestigious private school. However, Lorelei doesn't have enough money to pay for her daughter's tuition, and she goes to her parents for help. It is difficult for Lorelei because she and her parents have very complicated past and their relationship is tense.

I managed to recognize three important themes in this episode – private and public schools, being a single parent, and the relationships between parents and children. Here is a set of guiding questions that I have developed to start off the discussion prior to watching the episode:

1. Public School VS. Private School. Is it common for parents to send their children to private schools in your country?
2. Is it difficult to get into a private school? Is it expensive?
3. Why do some parents prefer to send their children to private schools? What are the benefits?
4. Are there many single-parent families in your country?
5. What are the major difficulties that a single parent faces every day?
6. What sources of support does a single mom usually have?
7. How important is it to maintain close relationship to your parents, especially later in life?
8. Are there any situations in life that may cause families to stop or dramatically reduce communication? What situations may that be? Is it common in your country?

Another way to prepare students for watching the show is to prepare short information about the main characters of the episode, especially if they are being introduced for the first time. Having the background knowledge prior to watching also adds to students' confidence and excitement about the series.

Finally, it is important to introduce students to the vocabulary in the episode. When selecting the vocabulary, a teacher should be guided by the students' proficiency level and choose the words and idioms that are most important to understand the plot. When selecting the vocabulary, I also gave preference to words that were on the

Academic Word List (Coxhead, 2000). Because of the program focused on English for Academic Purposes, utilizing the Academic Word List in this course ensured that the new vocabulary was not only useful for understanding the TV-show, but also for their future academic lives.

While-Watching. The purpose of while-watching activities is to activate students' attention to retain specific information about the episode – names of main characters, their relationship to each other, or major plot events. The types of activities appropriate for this purpose are not unlike traditional activities found in language quizzes and tests: identifying true or false statements, matching pictures with descriptions, multiple choice questions, and short answers. It is important to remember that the cognitive load of watching and comprehending the episode combined with multiple while-watching activities can easily overwhelm the learners and may cause them to underperform. I recommend instructors to develop no more than two simple while-watching exercises per episode.

Post-Watching. Activities in post-watching part of the lesson mainly focus on two goals: check students general understanding of the plot and encourage critical and analytical thinking. Understanding the plot and vocabulary is an important goal for beginning level students which can be achieved through asking questions, leading discussions, or role-playing situations from the episode. Additionally, similar exercises to the ones used in while-watching activities may be used for post-watching, however in-class discussions and interactions among students who are eager to share their opinions after watching the episode usually result in better understanding and learning. Depending on the course objectives, instructors may emphasize vocabulary, listening, speaking, , and the activities can be adjusted accordingly.

When developing post-watching activities for intermediate and advanced language learners, teachers should allow them take advantage of the group discussions to analyze the episode and critically evaluate the situations they saw on the screen. Students can demonstrate their higher level of thinking beyond simply retelling the plot by making inferences and predictions about the future of the characters or situations. The instructor may also organize a debate where students would pick a side in an argument, use details from the episode to support their points, and convince other students. Post-watching activities are also effective for discussing cultural elements that might be new or unusual for the language learners. Students can compare their own experiences with the situations from the episode and find similarities and differences across cultures and societies. Post-watching activities is a powerful space to reflect on the situations, relationships, opinions, and values as they are perceived by different people.

Conclusion

With the introduction of technology in the educational field, learning spaces have undergone dramatic transformations to match the ever-changing digital landscape of society. It calls for the development of new methods of language instruction. Authentic video materials such as TV-shows introduce the new medium for second language acquisition with the potential to retain high levels of student engagement and motivation, which is typically challenging for a traditional classroom setting. Structured and well-developed models of using video materials for language teaching

have proven to have positive effects reflected in improved high student achievement. Additionally, TV-shows provide an important link between language teaching and cultural immersion which add authenticity to the language learning experience. They target all major language aspects as a unit without separating each individual skill while also expose students to varieties of cultures, social components, and promote high order thinking.

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Using the Delphi Method to Identify Technical Workshop Topics

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Abstract

This research utilized the Delphi method to collect data from a selected panel to both identify and rank the importance of technical workshop topics in one of the sixteen Career and Technical Education (CTE) Pathways. The primary reason for selecting this research method was based on past research where it was utilized in gaining consensus on curricular items. Other reasons for selecting this research methodology included the diversity of the panel members being located in different areas of the United States, and the limited past research in this area. Also, items that were later rank ordered in round two and three were originally unknown in round one. The design of this Delphi study allowed researchers to gather information from 12 panel members. Diversity, within this panel, was utilized to ensure that input was provided from all aspects of this technical area. The final panel was comprised of four of the participants being employed by or owners of a related business and industry, four participants being graduates of a related CTE area within the previous four years and employed in a related occupational area, and four participants being educators teaching in a related pathway. The three round Delphi method accomplished the outcome sought, to identify and rank order a list of proposed workshop topics. It was also determined that the Delphi method had both advantages and disadvantages in developing this list. The researchers would propose to share the identified advantages and disadvantages.

Keywords: Career and Technical Education, Delphi Method, Technical Workshops, CTE Teacher Workshops

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Introduction

The Kansas Center for Career and Technical Education (KCCTE) was developed through a legislative grant to support teacher professional development for those teaching in Career and Technical Education (CTE) programs and pathways in the State of Kansas. One of the main objectives of the KCCTE was to help enhance the technical skills of CTE teachers/instructors and thereby improving the experience of their students. Although there are 16 different pathway in CTE, this study was designed to identify the needed skills for Career and Technical Education instructors who teach in the Architecture and Construction pathway/program.

The Delphi technique was chosen as research method because it is regarded as a reasonable strategy for achieving consensus on additions to and deletions from current curriculum (Thaangaratinam and Redman, 2005). Deciding what constitutes good practice is essential to establishing competencies for curriculum development. To reduce bias, it is critical to maintain the diversity of the panel of experts. This would require careful consideration of differing views and opinions based upon industry input rather than solely on educational input. Within this study, the Delphi technique was used to obtain and identify both differences of opinion and build consensus from the selected panel of experts. The Delphi study is best used where there is a problem that can be addressed with subjective judgement that can be given by expert panel members. This is based on the notion that "the collective viewpoints of expert panelists can yield better results than the limited view of an individual" (Nworie, 2011, p.29). Nworie (2011) also contends that the Delphi method is best used in studies where the goal is to identify new directions in a field, new or emerging competencies, best practices, changes, technology applications, and policy issues in order to improve what is happening in the field, making the Delphi a good fit for this study.

Typical surveys attempt to identify "what is," whereas the Delphi technique is used to address "what could or should be" (Miller, 2006). This allows the researchers to arrive at a conclusion of what the future curriculum needs to include. The Delphi Method is very useful for predicting the future and for making policy and planning decisions (Williamson, 2002).

The number of rounds used in a Delphi study is variable and depends upon the purpose of the research. Bammer, McDonald & Deane (2013) suggest a two or three round Delphi is sufficient for most research. If the purpose of the study is to reach group consensus and the sample is relatively dissimilar, then three or more rounds may be required. As the number of rounds increases, so does the effort required by Delphi participants. This often leads to a fall in the response rate (Alexander, 2004; Rosenbaum, 1985; Thomson, 1985).

Typical Delphi Process
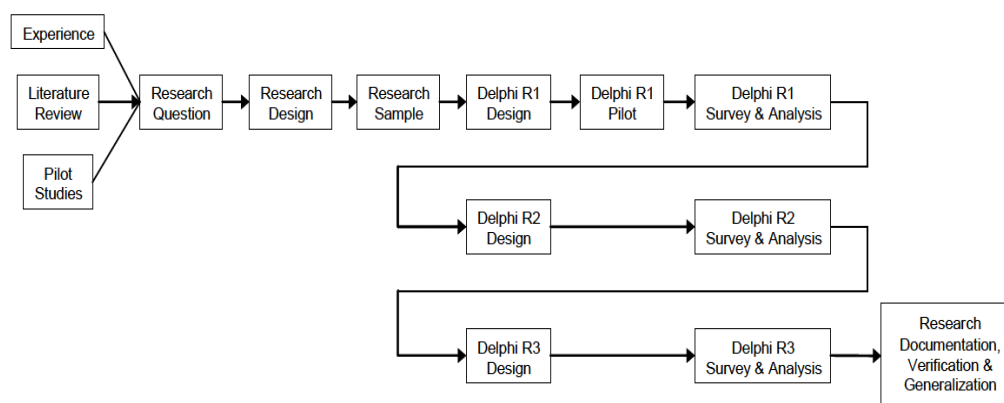
Figure 1: Three Round Delphi Process
Skulmoski, Harman and Krahn (2007)

Past researchers suggest (Judd, 1972; Taylor & Judd, 1989; Jacobs, 1996) choosing appropriate subjects for the expert panel is the most important step in the entire process of conducting a Delphi study because it directly reflects the quality of the results. Diversity in the background of panel members can be advantageous as it adds a broader and deeper understanding of the issue by having multiple individual perspectives on the same issue (Nworie, 2011). Delphi panel experts should be competent within the area of knowledge surrounding the target topic and should demonstrate knowledge that members of society at large and recognized professions would see as being of expert quality (Hallowell & Gambatese, 2009).

Rowe and Wright (1999) determined a Delphi panel may consist of as few as three members or as many as 80 on the high side. Most studies, they found, used a panel of between eight and 16 members so they suggest a minimum of eight although no direct correlation between the number of panel members and their effectiveness was cited.

Delphi panelists should meet four requirements in order to be considered an "expert": "i) knowledge and experience with the issues under investigation; ii) capacity and willingness to participate; iii) sufficient time to participate in the Delphi; and iv) effective communication skills" (Adler & Ziglio, 1996, p. 14). Each panel member's commitment to participate in a multi-round Delphi can be determined by the response rate in each successive round (Keil, Tiwana & Bush, 2002). Often, true experts in a field have great insight, yet are usually very busy and may not be able to fully engage.

Body

For the purpose of this study, the researchers chose a panel of 12 members. Four of these members were from areas in business directly related to the architecture and construction industries from companies, unions, or entities deemed progressive and upstanding via personal reputation and represented their own industrial entity during the study. Four of the members were from education. These four were chosen from both secondary and post-secondary institutions to participate based upon having been recognized as outstanding educators and stated so by their peers. The remaining four panel members were recent graduates from a secondary or post-secondary architecture and construction program who were currently employed in the architecture and construction field. These four members were

recommended to participate by their previous instructors. All panel members resided and were employed in the state of Kansas.

Gender did not factor into the screening process. Several individuals and entities were sought out to participate in the study some of whom were females. All of the females and several other individuals chose not to respond to the solicitation email; thus, all 12 identified members of the original panel were male.

Among the 12 panelists chosen for the study, age did not factor into the screening process, but reflected a diverse group of participants with one-third (33.3%) reporting an age range of 20-30, less than one-fifth (16.7%) reporting an age range of 31-40, one-quarter (25%) reporting an age range of 41-50, and one-quarter (25%) of panel members reporting an age range of 51 or older. The amount of education was not a consideration in screening panel members but did reflect a diverse group. One participant (8.3%) reported no higher education degree. Two panelists reported receiving trade or technical training resulting in 16.7% of the total. Five panel members (41.7%) reported having attained a Bachelor's degree and four panel members (33.3%) reported having attained a Master's degree.

Email solicitations were sent beginning in February to qualified persons who fit the criteria of educators, business and industry personnel and recent graduates and who were recommended to participate. The study concluded with the results of the third-round survey in the month of November.

In round one, 23 technical competencies were identified by the panel. Within round two, the panelists were asked to rate each of the items using a 5-point Likert scale (1 = completely unimportant, 2= not very important, 3= important, 4= very important and 5= extremely important). Within the round 3, each panel member was sent the results of round 2 (means and SD) of each Likert item and were asked if they wanted to change their ranking of this to be closer to the mean.

It was determined the Delphi method had both advantages and disadvantages in developing this list. Some of the topics that were identified in round one were considered non-technical in nature. Still other topics were considered to be duplications of those identified by other panelists. The non-technical topics and those that were considered to be duplications were eliminated. A third party helped to identify the topics that were eliminated. All of the topics identified by round one were previously unknown to the researchers, thus accomplishing one of the main advantages of the Delphi which is to identify things that are previously unknown.

Twelve panel members were sent the round one survey. Of the 12, only eight panel members responded before the data was compiled and round two was sent out. The responses of the eight participants yielded a response rate of 66.6%. The goal of the first round was to identify what educators teaching in an architecture and construction program in either a secondary or postsecondary institution, industry personnel specifically in architecture and construction and recent graduates of an architecture and construction program perceived to be the areas where there were skill gaps or what the future competencies would be in the field of architecture and construction. Each individual was asked to identify up to five topics to be considered by the members of the Delphi panel. The only restraint placed on these individuals was that the topics contrived had to be technical in nature.

The responses from the eight participants who completed and returned the round one survey were compiled and analyzed by the researcher and a colleague separately and examined for duplication, clarity and the technical nature of the topic. The researcher and colleague compared the generated lists of topics and selected those which were deemed technical in nature. Responses that were duplications or considered to be non-technical were eliminated for the development of the round two survey. It was determined that five topics identified by the participants were non-technical in nature. The topics deemed non-technical in nature included: Verbal communication, responsibility for self, time management, professional practice and document control. Computer skills, fundamental construction skills, and layout techniques were each identified twice by different participants. Industry specific software and design/build were identified three times by different participants. Plan and print reading and verbal communication were identified four times by different participants.

From the edited list of responses, 23 technical competencies are needed by those entering the architecture and construction field in the future were identified and condensed for inclusion in round two. The identified technical competencies were: Industry specific software, 4D schedules, plan/print reading, computer skills, control of a set of drawings, design/build, professional/technical writing, civil plan reading, scheduling, fundamental construction skills, graphic skills, coping style trim work, textures and drywall finishes, stick framing, window and door installation, concrete finishing, OSHA safety, technical drafting skills, design development process, layout techniques, welding and metal fabrication, mechanical trades, and building codes and state statutes.

Those who did not complete the round one survey were not included in round two data collection, therefore, eight participants were sent the survey for the second round. Of those eight participants who were sent the round two survey, seven completed the survey and sent it back. The responses of the remaining seven participants yielded a response rate of 87.5% which is much higher than the 66.6% response rate from round one.

As described in the previous section, responses from the eight participants who completed and returned the round one survey were identified, edited for clarity and duplication, verified the topic was technical in nature and condensed for inclusion in round two. Given the list of identified and edited topics from round one, participants were asked to rate the topics on a five-point Likert scale as to their perceived level of importance in rounds two and three (Allen & Seaman, 2007). A rating of "5" on the scale would mean the topic was perceived to be extremely important, a rating of "4" would mean the topic was perceived to be very important, a rating of "3" would indicate the topics was perceived to be important, a rating of "2" would indicate that the topic was perceived to be not very important, while a rating of "1" would mean the topic was perceived to be completely unimportant.

Table 1 presents a numeric representation of the responses of the seven participants who completed and returned the round two survey. The individual response of each participant is included along with the mean and standard deviation of the responses from this group of participants.

	Mean	SD	#1	#2	#3	#4	#5	#6	#7
OSHA	4.43	.787	5	5	3	4	5	4	5
Plan and print reading	4.29	.756	4	5	3	5	5	4	4
Software	4.14	.900	4	5	3	5	5	3	4
Computer skills	4.14	.900	5	5	3	4	5	3	4
Design/build	4.14	.900	3	3	4	5	5	4	5
Prof/tech writing	4.14	.690	4	3	4	5	5	4	4
Control of drawings	4.00	1.000	3	5	3	5	4	3	5
Scheduling	4.00	.816	3	5	4	3	5	4	4
Construction skills	3.71	1.113	5	5	2	3	4	4	3
Drafting	3.57	1.272	4	2	3	5	5	4	2
Civil plan reading	3.57	.787	3	5	3	3	4	4	3
Mechanical trades	3.57	.976	3	2	4	4	3	5	4
Building codes and statutes	3.57	1.272	2	2	4	5	4	5	3
Layout techniques	3.43	.976	2	3	4	3	4	5	3
Design processes	3.43	.787	3	2	4	4	4	3	4
Concrete finishing	3.00	1.000	3	5	3	3	2	3	2
Window/door installation	3.00	.577	3	2	3	3	4	3	3
Stick framing	3.00	.577	3	2	3	3	4	3	3
Graphic skills	3.00	1.155	4	2	2	5	3	3	2
Welding and fab	2.71	1.113	2	2	3	3	2	5	2
4D Schedules	2.43	.976	2	2	4	1	3	3	2
Drywall finishes	2.00	.816	3	1	2	1	2	3	2
Trim work	2.00	.816	3	1	2	1	2	3	2

Table 1. *Round 2 survey results and individual ratings*

The responses from the seven participants who completed the round two survey were analyzed and the mean and standard deviation for each topic was calculated. Only the top 15 topics with the highest perceived rated Mean were included in the round three survey. The top 15 topics with the highest perceived level of importance included: Industry specific software, plan/print reading, computer skills, control a set of drawings, design/build, professional/technical writing, civil plan reading, scheduling, fundamental construction skills, OSHA safety, technical drafting skills, design development process, layout techniques, mechanical trades, and building codes and statutes.

Of the seven participants who responded to the round two survey and were included in round three, seven responded yielding a response rate of 100% from round two to round three, but only a 58.3% response rate from the original 12 selected panel members. The 15 top ranked technical competencies were included in the round three survey and the participants had the opportunity to compare their rating with that of the group Mean and either confirm or change their initial rating (Skulmoski et al., 2007). Table 2 presents a numeric representation of the responses of the seven participants who completed and returned the round three survey. The individual response of each participant is included along with the Mean and Standard Deviation of the responses from this group of participants.

	Mean	SD	#1	#2	#3	#4	#5	#6	#7
Plan and print reading	4.43	.787	4	5	3	5	4	3	5
OSHA	4.29	.756	4	5	3	5	5	4	5
Design/build	4.29	.756	5	5	4	4	4	3	4
Scheduling	4.14	.690	4	5	3	4	3	3	5
Prof/tech writing	4.14	.690	4	3	4	5	5	4	5
Computer skills	4.14	.690	4	3	4	4	5	4	5
Software	4.14	.900	3	5	3	4	4	4	4
Control of drawings	3.86	.900	3	5	4	4	5	4	4
Construction skills	3.86	1.069	5	5	2	3	4	4	4
Civil plan reading	3.86	.690	5	5	3	4	4	4	5
Layout techniques	3.71	.756	4	2	3	4	4	4	3
Mechanical trades	3.57	.976	3	2	4	4	4	3	4
Design processes	3.43	.787	3	3	4	4	4	5	3
Drafting	3.43	.787	3	2	4	4	3	5	4
Building codes and statutes	3.29	.951	3	2	3	4	3	5	3

Table 2. *Round 3 survey results and individual ratings*

The responses from the seven participants who completed Round Three were analyzed and placed in order of perceived importance per the group mean from the third-round survey. All of the 15 technical competencies were deemed "important", "very important", or "extremely important" by the group having received an importance rating of above 3.0 as a group Mean. Plan/print reading was deemed by the group to be the most important technical competency of the 15 that were included in the third-round survey with a group Mean rating of importance at 4.43. OSHA and design/build were a close second with a group Mean rating of importance of 4.29. Scheduling, professional/technical writing, computer skills and industry specific software were all tied for the third level of importance with a group mean rating of 4.14. These seven topics were deemed by the Delphi panel to be the dominant technical competencies to effectively teach architecture and construction at the secondary and post-secondary level.

Control of drawings, construction skills and civil plan reading were in a three-way tie for the next rated level of importance with a group Mean rating of 3.86. Layout techniques received a group Mean rating of 3.71. Mechanical trades were rated at 3.57. Design processes and drafting both received a group Mean rating of 3.43, and building codes and statutes received a perceived importance group Mean rating of 3.29. Each of the 15 technical competencies were deemed "important", "very important", or "extremely important" by the group having received an importance rating of above "3.0" as a group mean.

For the purpose of this research, similarities and differences in perceived levels of importance between groups was analyzed. Of the seven participants who responded to all three rounds of the survey, only one was an instructor at an educational institution. This accounts for the Standard Deviation in the Education column being zero.The areas of most agreement between groups were the following: The use of industry specific software was rated at 4.25, 4.0 and 4 by members of business, recent graduates and the instructor, respectively. This

accounts for only a .25 difference in perceived level of importance across groups. Likewise, the control of a set of drawings also had only a .25 difference in perceived level of importance across groups. Plan and print reading, design/build, professional/technical writing, and design processes all showed only a .5 difference in level of perceived importance across groups.

Computer skills were rated "extremely important" by the educator at 5. The business participants rated computer skills just above "very important" at 4.25, while recent graduates rated computer skills just above "important" at 3.50, thus, there was a difference of 1.5 points of level of perceived importance between the groups. Scheduling was rated at 4.5 by members of business, 4.00 by recent graduates and 3 by the educator. This also accounts for a 1.5 point difference of level of perceived importance between groups. Basic construction skills were rated at 3.5 by members of business, 4.00 by recent graduates and 5 by the educator resulting in a difference of 1.5 points on the level of perceived importance between groups. Mechanical trades were rated 3.25 by members of business, 4.5 by recent graduates and 3 by the educator, resulting in a 1.5-point difference in level of perceived importance between groups. The participant from education rated computer skills very high as opposed to the rating by recent graduates. The educator also rated basic construction skill very high as opposed to the perceived level of importance by members of business. However, recent graduates rated mechanical trades much more important than either members of business or the educator, and members of business rated scheduling much more important than the educator (See Table 3).

	Business		Recent Graduates		Education	
	Mean	SD	Mean	SD	Mean	SD
Software	4.25	.957	4.00	1.414	4	0
Plan and print reading	4.50	1.000	4.50	.707	4	0
Computer skills	4.25	.500	3.50	.707	5	0
Control of drawings	3.75	.957	4.00	1.414	4	0
Design/build	4.25	.957	4.50	.707	4	0
Prof/tech writing	4.00	.816	4.50	.707	4	0
Civil plan reading	4.00	.816	4.00	.000	3	0
Scheduling	4.50	.577	4.00	.000	3	0
Construction skills	3.50	1.291	4.00	.000	5	0
OSHA	4.00	.816	4.50	.707	5	0
Drafting	3.25	.957	3.50	.707	4	0
Design processes	3.50	1.000	3.50	.707	3	0
Layout techniques	3.75	.500	4.00	1.414	3	0
Mechanical trades	3.25	.957	4.50	.707	3	0
Building codes and statutes	3.00	.816	4.00	1.414	3	0

Table 3. *Mean between groups and Standard Deviation within groups*

Conclusions

The purpose of this study was to identify the future technical competencies for architecture and construction educators so technical workshops could be designed to fit those needs. This study provided a framework for further identification of technical competencies within the architecture and construction areas of CTE as well as any other CTE areas where a need

exists to identify future technical competencies. Based on the information in Table 3, the educator rated three items at a much higher level of importance than the other groups. These items included: Computer skills, basic construction skills and OSHA Safety. From the standpoint of an educator, these items were perceived to be extremely important whereas industry personnel and recent graduates may not see them as being quite so important. On the contrary, business and industry personnel tended to rate plan/print reading and scheduling higher in level of importance than the educator while recent graduates closely agreed on the importance of these items. Recent graduates rated mechanical trades much higher in level of importance than members of business and industry or the educator, indicating their perception of a skill that is greatly lacking from their point of view, while other technical competencies were rated similar to the other groups. The findings presented in Table 2 point to a lack of technological expertise. Six of the seven highest rated technical competencies could be considered to be directly related to technology. This finding falls directly in line with the views of Laczkowski, et al. (2018), as they determined technological advancements, innovation and adoption of the latest technology in the construction industry had been lacking accounting for an approximate 30 percent gap in production across the construction industry. OSHA safety was tied for second place in Mean ratings which indicates the participants all deemed safety was a priority. A majority of the responsibility for safety instruction lies with the CTE instructor. "Students must receive an endless amount of general and specific safety education" (Threeton & Walter, 2013, p. 66-67).

Research has suggested properly identifying professional development needs which are in high demand is a crucial part of developing effective teachers (Layfield & Dobbins, 2002). Technological advancements, innovation and adoption of the latest technology in the Construction Industry have been lacking (Laczkowski, Padhi, Rajagopal & Sandrone, 2018). Part of this slow-moving adoption of new technology may have been due to the roadblocks put in place which hindered professional development of teachers (Drage, 2010).

The implications for practice of this study represent a basis on which the KCCTE can design, coordinate and support relevant and needed technical workshops to help architecture and construction educators stay current in the technical skills of their field. While the findings of a Delphi study only reflect the opinions of a small number of people at one particular point in time, this study determined there is a need for technical training for educators on several future competencies. The KCCTE will begin to work through the list of most important perceived technical competencies identified in this study and offer workshops to address those competencies.

Plan and print reading had the highest rated Mean score which makes this competency the most likely choice to begin designing a technical workshop around. Referring to the list of highest Mean rated competencies from Table 2, six of the seven competencies that had a Mean rating of above 4.0 could be deemed technological in nature. This may actually allow for some combination of topics into single workshops rather than having separate workshops designed around each competency. Computer skills and industry specific software are two technical competencies which would fall into this category. Design/Build and Scheduling are two identified technical competencies which could possibly be combined into one technical workshop with the possibility of offering more advanced levels of this topic in the future. OSHA Safety was a top-rated competency which would be considered technical but not technology based. Safety should always be a major priority for CTE classrooms and labs. Instructors must "focus on their own professional development by attending technical update workshops that provide occupational specific information on new safety practices" (Threeton

& Walter, 2013, p. 67). OSHA Safety is a topic that a technical workshop should be designed for to meet the needs of CTE teachers. Professional/technical writing was a competency rated high in importance by participants and could be incorporated into each technical workshop to help meet the gap in this area. Based upon the findings that suggest a theme of graphics and visualization among the identified technical competencies, workshop presenters should be sure to incorporate activities in each of their workshops to increase competence related to these skillsets. Looking back at the findings from the round two survey, it is recommend that the lower Mean rated technical competencies not be considered priorities for technical workshops. These competencies include: 4D scheduling, trim work, drywall finishes, and welding and fabrication. While these competencies may still be important skillsets to possess, they were not seen by participants to be areas where a large amount of concentration was needed.

Putting the panel of experts together and getting individuals to agree to participate may seem like an easy task. It is not. This was undoubtedly the most time-consuming part of the Delphi process, which came as a surprise to the researchers. Another surprise was, of the 12 panelists who agreed to participate, only seven members of the panel completed all three rounds of the survey within the allotted amount of time An assumption was held that panel members involved in the education field would be more likely to participate fully. This was in error as only one of the educators completed all of the surveys in the timeframe allotted.

Given the limitations of this study and the findings, further research is recommended. Future studies could investigate any or all of the CTE areas in the state to identify different technical competencies where training is needed to meet the demands of their respective industries. This study could be easily replicated in other states and be similarly implemented on a national or international level to identify different technical competencies where training is needed to meet the demands of industry. A recommendation would be to include ample time to gather a sufficient number of panel members so the number of actual participants involved in the study yields the appropriate amount of data to maintain a solid foundation and premise of need. Another recommendation would be to start with a larger panel of 20–24 people evenly spread between the groups of educators, recent graduates and business and industry personnel. This could alleviate the challenges associated with the low numbers in some groups due to attrition. If the study were replicated, the researcher recommends the participants making up the panel of experts have equal representation in each of the current occupational areas. It would be interesting to send the round three survey, listing the 15 top rated competencies to a larger number of individuals from each of the occupational groups represented and compare the results of their ratings with those found in this study to determine to what extent the results agree with and differ from what was found in this Delphi study.

This Delphi study had its share of limitations and disadvantages. Since only seven members of the panel completed all three survey rounds, the results of the study had to be based solely on those results. This study was also limited to the state of Kansas.

The researchers did have two panel members who completed and returned surveys after the deadline. These were not included in the research because of the missed schedule. It is recommended that more time to complete the rounds of the study may increase participation rates.

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Using Maximum Variation Strategy Within A Case Study to Investigate Reasons
Contributors are Willing to Provide Open Educational Resources

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Abstract
The intent of this exploratory study was to increase the body of knowledge and guide decisions regarding sustainability of Open Educational Resources (OER). Previous studies have reported one of the challenges facing facilitators of OER repositories is teachers' lack of willingness to contribute their instructional materials. This study, in contrast, investigated the reasons teachers *are* willing to develop and share OER instructional materials. Six cases (who were previous contributors to an OER repository) were chosen for face-to-face interviews using a maximum variation strategy. The goal of this unique strategy is to choose cases that will maximize learning by selecting individuals with a wide range of characteristics. Interview questions were developed to explore the question, "Why do CTE teachers contribute their intellectual capital to OER repositories?" Data condensation and data display strategies were implemented during data collection in order to interpret patterns and form conclusions. Inductive and deductive reasoning were utilized during data analysis, which included pattern coding. After pattern coding was finalized, cross-case analysis was conducted to enhance transferability and to deepen understanding. Triangulation was utilized to corroborate findings. The most significant finding of this study was that all cases expressed an understanding of the significance of contributing to OER as a result of previous teaching experiences categorized into three areas: professional experiences, challenging experiences, and networking experiences.

Keywords: open educational resources, OER, OER contributors, maximum variation strategy

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Introduction

The purpose of this study was to investigate why Career and Technical Education (CTE) teachers are willing to develop open educational resources (OER). A multi-case study methodology was utilized to interview six individuals who had contributed their intellectual property to an OER repository. Utilizing maximum variation strategy, individuals with a wide range of characteristics were chosen as cases in order to gain a deeper understanding. The findings of this study will contribute to the larger understanding of OER repositories for all teachers. With this understanding, facilitators of OER repositories can make future evidence-based decisions regarding the sustainability of OER repositories.

The site chosen for this case study was the Kanas Center for Career and Technical Education (KCCTE) Resource Library, located on the campus of Pittsburg State University (PSU) in Pittsburg, Kansas. The purpose of this professional development center for CTE teachers is to promote retention. The four main areas of support provided are:

- technical workshops to enhance industry skills
- OER resources to alleviate cost and time in instructional preparation
- mentoring for teachers within their first two years of teaching, and
- technical teacher education coursework for educational advancement

The KCCTE was developed as a response to the United State's nationwide gap between the amount of technical workers needed and the available skilled technicians to fill open positions (Kantrovich, 2007). This push for a more technically trained workforce has led to a need for more CTE teachers (Rojewski, 2002). While recognizing the need for more CTE teachers, there is a growing awareness of retention issues of CTE teachers, creating a CTE teacher shortage (Chenevey, Ewing, & Whittington, 2008; DeLay, 2013; Greiman, Walker, & Birkenholz, 2005; Johnson & Birkeland, 2003). The state of Kansas funded the KCCTE to provide support to CTE teachers in order to enhance the pipeline of skilled workers across the state.

Some of the challenges reported in earlier research include the need for an ever-changing technical curriculum (Skinner, Witte & Witte, 2011), a limited amount of time to plan and develop instructional materials (He & Cooper, 2011), and shrinking budgets (Chenevey et al., 2008; DeLay, 2013; Greiman et al., 2005; Johnson & Birkeland, 2003). One initiative developed by the KCCTE was to provide an OER repository specifically for CTE teachers in order to alleviate the excessive amount of time used for curriculum development.

While OER is growing in popularity (Schmidt-Jones, 2012; Tonks, Weston, Wiley, & Barbour, 2012; West, 2016; Wiley & Gurrell, 2009; Wiley, Hilton, Ellington, & Hall, 2012), there are also concerns about sustainability (Atenas & Havemann, 2014; McShane, 2017; Nascimbeni & Burgos, 2016). One important benefit is the cost savings to students who are not required to buy textbooks when an instructor adopts an OER textbook (West, 2016). According to Atenas & Havemann (2014), the promotion of OER leads to the opportunity for teachers to provide students with a higher quality instruction. Additional studies have explored the challenges facing OER repositories (Atenas & Havemann, 2014; McShane, 2017; Nascimbeni & Burgos, 2016; Pirkkalainen, Pawlowski, & Pappa, 2017; Wiley & Gurrell, 2009).

Quality of materials and sustainability of online instructional materials (Pirkkalainen et al., 2017) are two challenges OER librarians are faced with. Other challenges include the tedious tasks of selecting, organizing, disseminating, cataloging, updating, and promoting materials (West, 2016). Concerns have also been expressed about the quality of OER in terms of meeting state standards (Wiley & Gurrell, 2009).

Being aware of the challenges associated with facilitating an OER repository, the KCCTE provides OER instructional materials in an editable online format. Authors are provided a stipend for the development of their course. A user-friendly online platform is utilized for authors to submit their materials. Tutorials and a KCCTE staff member are devoted to assisting authors through the process. Materials are developed using required templates and specifications. A subject matter expert (SME) reviews all materials for relevance to the CTE area, offering suggestions for improvement before materials are published. Materials are reviewed and updated biennially. All materials are free to download, editable, and have no copyright restrictions attached. While recognizing the importance of each carefully developed procedure for developing materials, this study focused specifically upon why CTE teachers are willing to provide resources to the KCCTE Resource Library. It is acknowledged that without a continual growth of contributors, it is impossible to sustain the repository.

Body

The research question that guided this study was, "Why do CTE teachers contribute their intellectual capital to OER repositories?" Because the researchers are asking "why", a qualitative research method was utilized. To gain a more descriptive understanding of *why* or *how* things work, Patton (2014) suggests a qualitative study because it enables the researcher to capture people's stories. Within the qualitative methodology, a case study design was chosen. Creswell (2013) defines the case study as a "real-life, contemporary bounded system (a case) through detailed, in-depth data collection involving multiple sources of information" (p. 97).

A maximum variation strategy was utilized for choosing cases to interview (Krathwohl & Smith, 2005; Bloomberg & Volpe, 2016; Creswell, 2013). The goal of this strategy is to select individuals with a wide range of characteristics (Bloomberg & Volpe, 2016). The KCCTE Resource Library was the chosen site for this study because of the researchers' close involvement with the development and maintenance of the OER repository. The following criteria were met to be considered as a case for this study:

(a) Must currently be teaching Career and Technical Education (CTE) course(s) in a secondary or post-secondary institution.
(b) Must have submitted one or more open educational courses to the KCCTE Resource Library.
(c) Must have successfully met all obligations of the KCCTE Resource Library Contributor Agreement.

At the time of the study, 15 full-time CTE teachers had successfully contributed complete courses to the KCCTE Resource Library as shown in Table 1. These curriculum contributors were current teachers from six CTE career fields (Agriculture, Business, Family & Consumer Sciences, Media & Technology, Design,

Production & Repair, and Health). At the time of the study, it seemed important to gain an in-depth understanding of this phenomenon by interviewing someone who had contributed often and someone who had chosen to only contribute once. Insight was also expected to be gained by choosing cases from the various CTE content areas from both secondary and post-secondary institutions. It was assumed that by choosing cases with a wide variety of characteristics, a more in-depth understanding of all CTE teachers would occur.

ID	Career Field	Teaching Level	No. of Course Contributions	Distance (one way)
01	Agriculture	Secondary	1	70 miles
02	Agriculture	Secondary	1	483 miles
03	Business	Secondary	1	25 miles
04	Business	Secondary	1	291 miles
05	Media & Technology	Post-Secondary	1	0 miles
06	Media & Technology	Secondary	2	104 miles
07	Media & Technology	Secondary	1	109 miles
08	Design, Production & Repair	Post-Secondary	3	0 miles
09	Design, Production & Repair	Post-Secondary	2	240 miles
10	Design, Production & Repair	Secondary	1	120 miles
11	Design, Production & Repair	Secondary	1	120 miles
12	Family & Consumer Sciences	Secondary	5	179 miles
13	Family & Consumer Sciences	Secondary	3	131 miles
14	Family & Consumer Sciences	Secondary	2	57 miles
15	Health	Secondary	2	105 miles

Table 1: Possible cases

These 15 cases were input into a table and sorted first by career field, then by teaching level, then by the number of courses contributed to the KCCTE Resource Library, and finally, by geographical distance from PSU. After the sort, the first person from each career field was chosen and invited by email to participate in a face-to-face interview. Taking time constraints into consideration, the most convenient location was the deciding factor when all other factors were equal. All six cases shown in Table 2 were chosen and invited by email to participate in the study, and all six accepted the invitation.

From the Agriculture career field, two teachers had contributed. Both were secondary teachers who had contributed one complete course. Because all variables were equal

between the two contributors, this case (listed as ID 01 from Table 1) was chosen based upon location convenience.

From the Business career field, two teachers had contributed courses, and the case invited to participate (listed as ID 03 in Table 1) was chosen due to location convenience. Both possible cases were secondary teachers and had submitted one course to the KCCTE Resource Library.

There were three contributors who met the defined criteria from the Media & Technology career field. The case chosen (listed as ID 05 in Table 1) was a post-secondary teacher who had submitted one course. As there are fewer post-secondary contributors than secondary contributors, it was expected that this participant might provide insight into the perceptions of post-secondary teachers' willingness to provide content to OER repositories.

From the Design, Production & Repair career field, four teachers had contributed a total of seven courses. The Design, Production & Repair career field includes teachers from the architecture and construction, engineering, manufacturing, and transportation career fields. Three of the possible cases in this career field teach automotive courses, and one teaches drafting courses. Two possible cases teach at the post-secondary level, and two at the secondary level. In an effort to gain diversity, the case chosen for this career field (listed as ID 08 in Table 1) was a post-secondary teacher who had made three submissions.

The chosen case from the Family & Consumer Sciences career field (listed as ID 12 in Table 1) is a secondary teacher who had developed and contributed five courses, the most contributed to the KCCTE Resource Library. The Family & Consumer Sciences career field teachers collectively have contributed 10 courses, the most content submitted by one career field to the KCCTE Resource Library.

The sixth case (listed as ID 15 in Table 1) is a secondary teacher from the Health career field. This teacher has contributed two courses to the KCCTE Resource Library, and at the time of this study, was the only Health teacher meeting the set criteria.

Career Field	No. of Course Contributions	Teaching Level
Agriculture	1	Secondary
Business	1	Secondary
Media & Technology	1	Post-Secondary
Design, Production & Repair	3	Post-Secondary
Family & Consumer Sciences	5	Secondary
Health	2	Secondary

Table 2: Characteristics of chosen cases

Many forms of data were collected during this study. Primary data was obtained through semi-structured interviews of the six chosen cases. Two pilot interviews were conducted to refine the interview protocol. Each interview was scheduled for an hour and a half and interviews were recorded and transcribed. Contact summary forms were completed and sent to each case to confirm an accurate perception of each case's responses. All six contact summary forms were approved. Secondary forms of data included gathering forms and information recorded during the contribution process for each case. The secondary forms of data were used for corroboration of data gathered during interviews and aided in providing triangulation during the collection, analysis and findings phases of the study.

During data collection, three actions were conducted simultaneously in an effort to add clarity as recommended by Miles, Huberman, & Saldana (2014): data condensation, data display, and forming conclusions. Data condensation involves transforming the data as it is collected into a chunked, stronger version. Data display involves creating organized tables and other documents in order to better understand what is happening. Forming conclusions involves interpreting patterns and propositions emerging from the data (Miles et al., 2014). During transcription, data was coded using the comment feature with Microsoft Word. These codes were then exported from Word using a macro to an Excel document where they could be chunked and pattern coding was applied. Cross-case analysis was also possible during this step, allowing for transferability of the study. This process also resulted in data condensation. Once the patterns were discovered and data was categorized into a workable number, the data was transferred to data display tables. The visual representation of data allowed conclusions to be formed.

One of the most significant findings of this study was that All cases (6 out of 6 [100%]) expressed an understanding of the significance of contributing to OER as a result of a previous experience as a CTE teacher.

As shown in Table 3, previous experiences were divided into three subcategories: professional experiences, challenging experiences, and networking experiences. Two teachers reported that the primary factor in their decision to contribute was the importance of sharing the knowledge they had acquired from their years of professional experience.

> There's just that altruistic piece of, I have a lot of knowledge to share… And what an amazing thing for me to be able to go through the creative process of building a lesson from that information, and then share it with somebody else. That feels like the right thing to do to me. That's what motivates me. And that's part of why I do this, you know? (Interview 04)

Another teacher expressed the contributing factor as an opportunity to be part of the movement of OER.

While almost all teachers reported the challenges of curriculum development for CTE teachers, two teachers expressed the initial contributing factor as an opportunity to help themselves be more organized by developing a more detailed curriculum, and one expressed the desire to help other new teachers who might be facing challenges. Another teacher expressed the primary contributing factor as a perceived benefit for others, reporting a desire to give back.

> I vividly remember starting teaching and having nothing and relying on others to help. As a new teacher, you're just struggling to manage classroom things, let alone, now you've got to create curriculum, and from my standpoint, if I had not been told to give teaching two years, I would've quit the first year and I understand why they tell you that and it shouldn't be that way. So, you know, I kind of feel strongly that if you're going to go into teaching to start with you're already taking a cut in pay, and especially in the automotive area. You've got skills that are very, very marketable. And to make it hard on you, to start with, is just asking for people to leave the profession before they even get started. I would hope that any veteran teachers out there would jump on the opportunity to share what they have. I think most of us have the same story as I have starting out and struggling. (Interview 02)

All but one teacher expressed an understanding of the networking benefits they had previously experienced and wanted to continue. One teacher mentioned that she was already informally sharing curriculum through email and how much easier it was to guide teachers to the library instead of transferring large amounts of files through email.

Subsection	Themes/Comments within Subsection	Cases who Reported this Theme/Comment
Professional experiences	Legacy	02, 04
	Opportunity to be part of the OER movement	01
Challenging experiences	Curriculum development	01, 02, 03, 04, 05
	Extra duties	02, 03, 04, 05
	Lack of resources	01, 02, 03, 05
	Teaching workforce skills/ hands-on teaching	01, 02, 03, 04, 06
	Time required outside of school day	02, 03, 05
Networking experiences	Formal sharing	01
	Informal sharing	02, 05, 06
	Mentoring	04, 05

Table 3: Responses to Previous Experiences

Conclusions

While understanding the significance of OER to the CTE teacher seemed to be the most significant factor, this study also revealed that an opportunity to receive a stipend, having enough time to develop the materials, and being familiar with the entity hosting the materials were important as well. Through this study, several opportunities for further research have surfaced. Naturally teachers who alluded to leaving a legacy were demographically categorized in the above age 31 group. It might be beneficial for OER repository facilitators to further investigate the

correlation between willingness to contribute and the years of experience of the teacher. The topic of stipend seemed to illicit a variety of responses. Further investigation into the correlation between willingness to contribute and the opportunity for monetary rewards would provide further input to OER sustainability. Finally, one case reported that the initial reason for contributing was to be more organized. This response might indicate that the contribution process was more valuable to the contributor than the end user. OER repository facilitators might be interested in pursuing a study to understand this benefit to the contributor.

Interestingly, utilizing the maximum variation strategy did not seem to have an impact on this study. No significant differences were found between different content areas, teaching levels or number of courses contributed. While the researchers were expecting that some content area teachers might receive more support or have more resources available to them because of their content area, there were no findings to support this.

By exploring this topic, the researchers have been able to utilize the findings to make decisions regarding recruitment of contributors. Holistically, an increased understanding of the perceptions and experiences of CTE teachers who have created and shared instructional materials will potentially benefit the OER community. Teachers with increased access to affordable, copyright free materials will have more opportunities to bring innovative lessons to their students providing them with the knowledge and skills necessary to prepare them for a variety of careers. For CTE students, this opportunity of receiving a more rigorous technical education, places them in the position to obtain high-demand, high-wage technical positions in the workforce. This, in turn, can help alleviate the gap existing in the nation's technical workforce (Skinner, Witte, & Witte, 2011).

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Understanding Perceptions in Foster Care: Changing the Narrative

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Abstract

Changing the Narrative is a youth-initiated effort examining implicit bias toward youth and alumni of foster care (YAFC) with the intention to redress it within the education and social services sectors. Results from a survey of 2,488 Los Angeles County residents found that the majority held inaccurately negative perceptions about YAFC regarding the likelihood of extremely negative life events such as abuse, neglect, prenatal drug exposure, gang involvement, sex trafficking, and poverty. This perception was held by those who did and did not have direct experiences with YAFC. The media portrayals selected most often by respondents included criminals, drug addicts, survivors, and victims. Statistical evidence found associations between these media portrayals and the negative biases that the respondents held about the youth themselves. Framing Theory proposes that media exposure frames narratives for the public, even for those who directly interact with YAFC, potentially leading to a distressing cycle in which YAFC are consistently exposed to those who see them as deficient and, as they cope with early trauma, these negative stereotypes are reinforced. Conclusions highlight the need for the development of a counter narrative curriculum.

Keywords: public perception, foster care, implicit bias, media stereotypes

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Introduction

"They think we're criminals." A group of youth in foster care shared a meal together and discussed the way they believe they are perceived by society. From that initial conversation, a research study was designed to examine the perceptions of the general public about youth in foster care. Youth and Alumni of Foster Care (YAFC) transition through every developmental stage of life interacting with foster parents, educators, and child welfare professionals who likely enter those relationships with preconceived ideas about the experiences of these children based largely on their current or prior status in the foster care system.

Children with a lived experience in foster care are placed in environments (new homes, new schools, new neighborhoods) that have the potential to help or hinder their developmental growth. Although there is variation in the size and processes of the foster care systems across the world, there is common ground on the reasons for placing children in foster care and the long-term consequences of those placements (George, Van Oudenhoven, & Wazir, 2003; McDonald, Allen, Westerfelt, & Piliavin, 1996). In a review and assessment of foster care practices in both developed and developing countries, George and colleagues (2003) explain that "first order foster care refers to the day-to-day responsibility for children in need" and "second order foster care denotes a level at one remove ….and includes individuals and institutions that support and supervise foster care." (p.245).

The premise of this study is that the media is a meaningful source of the foster care narrative and that individuals in first order foster care such as foster parents and teachers as well as those in second order foster care such as social workers, police, and lawyers are exposed to a lifetime of media that inaccurately frames the experiences of these children as extremely negative. Negative expectations for children have the power to generate corresponding negative behaviors (Allen, Chango, & Szwedo, 2014; Kools, 1997; Loeb, Hessel, & Allen, 2016). As children cope with early trauma (Unrau, Font, & Murphy, 2011), their coping strategies may be perceived as a confirmation of pre-conceived negative expectations by the important adults who are present in their lives to keep them safe from harm. This implicit bias can permeate every aspect of development and repeated doses from across these environments can contribute to a self-fulfilling prophecy of negative outcomes.

Background

Little is known about the public perception of YAFC and, therefore, little is done to counter the narratives that are framed by all forms of media seeking to capitalize on sensational stories of abuse, neglect, sex trafficking, gang involvement, poverty, and prenatal drug exposure. In the developed world, these stories splash across news outlets, film, television, literature, web searches and social media (Alvarez, 2017; Chong & Druckman, 2007; Leber & LeCroy, 2012; Meese, 2012; Sims, 2018). YAFC are exposed to both the adults in their lives who hold these negative perceptions in mind and their own direct consumption of foster care media portrayals.

A review of existing literature establishes that YAFC are portrayed in movies as having behavioral problems or mental illness at significantly higher rates than real statistics indicate (Alvarez, 2017) and in newspapers as having significantly higher

numbers of negative outcomes as compared to positive outcomes (Busso, Down, Gibbons, & Volmert, 2019). Furthermore, these portrayals inaccurately reflect stereotypes of race, gender, culture, and socioeconomic status that do not match the foster care population (Fraidin, 2010). Alvarez (2017) analyzed 37 American movies from 1921 to 2012 and found that life in foster care was portrayed as consisting of multiple placements, exposure to violence, separation from family members, abuse, and running from care far more frequently than the actual statistics for these distressing events (Child Welfare Information Gateway, 2013). The FrameWorks Institute analyzed 215 American newspaper articles dated between 2016 – 2018 and found that individual stories reinforced specific foster care frames that include the hero caregiver, the bad apple, and the bootstraps story. These frames neglected to include references to the inequities within the system or the consequences of foster care for those it serves (Busso, Down, Gibbons, & Volmert, 2019).

As a parallel to the concerns about perceptions of YAFC that form the foundation of this study, Valentine and Freeman (2002) reported the impact of inaccurate media portrayals on perceptions of social workers, and suggested that "people who work in these positions are assigned the same stigma that society assigns to child welfare clients, simply through association" (p. 467). In other words, social workers face implicit biases simply because they work with the parents who have children placed in the foster care system. Valentine and Freeman (2002) described media portrayals that highlight a combination of 1) incidences of child fatalities while in care, ineffective leadership, overburdened caseworkers, limited resources, and incompetence, 2) biological parent substance abuse, incarceration, abandonment, and abuse of children, and 3) behavioral problems and mental illness in children. If professionals who work with child welfare clients face stigma, it seems likely that the children of these clients will also pay a similar consequence for their placement in foster care.

Theoretical Framework: Framing Theory suggests that any issue can be portrayed and perceived in a variety of ways based upon the interpretations of the media producers. The repetition of the same narrative reinforces beliefs that it is true and representative (Gerbner, Gross, Morgan, & Signorielli, 1994). Therefore, the people who enter into careers or volunteer service leading to direct contact with youth in foster care may believe a false narrative about the extent to which these youth have endured extremely negative experiences and have behavioral or mental health issues. Although, the hope would be that these negative perceptions are dispelled through pre-service training for careers such as social work and teaching, as well as in certification classes for foster parents, there is currently no evidence that such training exists.

Chong and Druckman (2007) called for transparency in the telling of foster care stories to create more accurate views of the foster care system because even small changes in the presentation can facilitate large changes of opinion. Fisher's (1984) narrative paradigm theory similarly states that people are drawn to stories which then become the basis of our understanding, particularly if the story is consistent and relatable.

A variety of American social movements in the past few decades have sought to create a safer society for the LGBTQ community, for understanding gender fluidity,

and for racial inequities. These movements have not yet fully completed their goals but they have brought awareness, evolved our language, and changed some perceptions. Media has played a significant role in these movements through the inclusion of diverse voices in the production of media, the diversity reflected in storylines and character portrayals, and by reporting on inequities that continue to exist. Costanza-Chock and Schweidler (2017) refer to this as transformative media organizing. To move towards creating a safer society for YAFC in which they can grow and develop as individuals who are not defined by pre-conceived deficits, we examined the connection between the current media narrative about YAFC and public perception of YAFC.

Methods

Participants: The context in which this research took place is in Los Angeles, California, a recognized media hub for the world and a county in which approximately 30,000 children are in foster care at any given time. This study included survey data from 2,488 respondents in the greater Los Angeles area; 57.2% identified as female, 41.6% identified as male, 0.4% identified as gender non-conforming, and 0.9% preferred not to answer. The distribution of racial identification and age are below:

White/Caucasian	29.3%		18-24 years	10.2%
Asian/Pacific Islander	26.0%		25-34 years	22.4%
Hispanic/Latino	18.3%		35-44 years	17.8%
Black/African American	17.8%		45-54 years	16.6%
Biracial	4.8%		55-64 years	15.3%
Native American	1.3%		65+ years	17.6%
Other	2.2%			

Measures: After several rounds of pilot testing in consultation with foster care alumni, the final version of the survey contained 23 item level questions with embedded sub-questions for a total of 122 data points. The categories of questions included demographic information, perceptions of foster youth's backgrounds, portrayals in media, and their own experience with the foster care system.

Sample Survey Questions

How do you think foster youth are most likely to be portrayed in the media? (Select one or more)					
•	Criminal	•	Sociopath	•	Mentor/Guide
•	Hero	•	Survivor	•	Sex worker/Pimp
•	Victim	•	Drug Addict	•	Role Model
•	Abuser	•	Professional	•	Loving Child or Parent

What percentage of foster youth do you think had the following experiences? (Scale of 1 – 100)

•	Sexual abuse	•	Prenatal drug exposure
•	Physical abuse	•	Poverty
•	Parental neglect	•	Gang involvement
•	Sex trafficking		

Results

An analysis of how familiar the respondents were with the foster care system revealed that only a minority of the sample had some prior personal and/or professional experience that may have contributed to their perception of YAFC. Of the 2,488 respondents, 14.7% identified as having personal experience with foster care and 20% identified as having worked or volunteered in a professional role with YAFC. Nearly half the sample rarely think about foster care (46.1%), 37.1% said they sometimes think about foster care, 4.5% said they think about foster care all the time and 12.3% chose not to answer. Less than 3% of respondents reported knowing 5 or more youth currently in foster care while less than 4% reported knowing at least 5 people who were once in foster care.

The most commonly identified media portrayal of YAFC was victim (72%), followed by survivor (41%), criminal (40%), and drug addict (30%). All other roles were identified by less than 20% of the respondents, thus subsequent analyses focused on these four portrayals. Respondents had the option of choosing multiple media portrayals. A co-occurrence analysis found that Victim and Survivor had the highest frequency of selection together (N=755), followed closely by Victim and Criminal (N=721). The other co-occurring sets of labels to note are Victim and Drug Addict (N=566) and Criminal and Survivor (N=407).

Using ANOVA with Bonferroni corrections (Tables 1a and 1b), the analyses revealed how respondents' demographics and experiences related to these four roles with main effects for gender, race, age, and direct experience with YAFC but no significant interactions. Specifically, post hoc analyses revealed that female respondents were more likely than males to select media portrayals of YAFC as survivors, criminals, and victims. Respondents who identified as Biracial were more likely than African American respondents to select victim for media portrayals of YAFC. African American and Biracial respondents were more likely than White and Asian Pacific/Islander respondents to select criminals. Biracial respondents were more likely than African American and White respondents to select that media portrays YAFC as drug addicts. Respondents who were 65+ years of age were more likely than those 25–34 years of age and 35-44 to report that media portrays YAFC as victims but they were less likely than those 18-24 years of age, 25-34, and 35-44 to report that media portrays YAFC as criminals.

Demographic Variable	Portrayal	Groups	M (SD)	Model

Gender	Victim	Female	.69 (.46)	$F(3,2470)=3.478^{**}$
		Male	.63 (.48)	
	Criminal	Female	.41 (.49)	$F(3,2470)=5.954^{**}$
		Male	.33 (.47)	
	Survivor	Female	.41 (.49)	$F(3,2470)=5.329^{**}$
		Male	.34 (.47)	
Race	Victim	Biracial	.79 (.41)	$F(6,2475)=2.280^{*}$
		African American	.62 (.49)	
	Criminal	African American	.46 (.50)	$F(6,2475)=7.617^{**}$
		Biracial	.55 (.50)	
		White	.33 (.47)	
		Asian/Pacific Islander	.32 (.47)	
	Drug addict	Biracial	.40 (.49)	$F(6,2475)=2.916^{**}$
		African American	.26 (.44)	
		White	.24 (.43)	
Age	Victim	65+	.73 (.44)	$F(5, 2482)=5.643^{**}$
		35-44	.59 (.49)	
		25-34	.64 (.48)	
	Criminal	65+	.28 (.45)	$F(6, 2482)=7.153^{**}$
		35-44	.72 (.45)	
		25-34	.64 (.48)	
		18-24	.64 (.48)	

Table 1a: Media Portrayals as a function of demographic variables. *p<.05, **p<.01

Respondents who identified as having a personal experience in foster care were less likely to select that media portrays YAFC as victims and survivors compared to those without personal experience in foster care (Table 1b). Respondents with professional experience in foster care were less likely to select that media portrays them as victims and survivors and more likely to select that media portrays them as criminals compared to those without this experience.

Direct Experience	Victim	With Personal Exp	.56 (.50)	$F(1,2435)=5.190^{**}$
		No Personal Exp	.69 (.46)	

	With Professional Exp	.60 (.49)	F(1, 2486)=11.738**
	No Professional Exp	.68 (.47)	
Survivor	With Personal Exp	.30 (.49)	F(1, 2435)=3.144**
	No Personal Exp	.40 (.46)	
	With Professional Exp	.33 (.47)	F(1, 2486)=7.525**
	No Professional Exp	.40 (.49)	
Criminal	With Professional Exp	.43 (.48)	F(1, 2486)=8.83**
	No Professional Exp	.36 (.48)	

Table 1b: Media Portrayals as a function of direct experience. *p<.05, **p<.01

Using similar statistical methods (ANOVA with Bonferroni corrections), the next set of analyses (Table 2) examined the relationship between respondent demographics and direct experience with YAFC on their perceptions of the probability that YAFC had endured one or more extremely negative experiences such as abuse, neglect, poverty, drugs, sex trafficking, prenatal drug exposure, and gang involvement. Overall, respondents were more likely to believe that YAFC had one or more extremely negative experiences (62.8%). Results revealed a significant effect of age in that respondents who were in the age range of 45-54 years were more likely than those in the age range of 18-24 years to respond that YAFC have a higher probability of extremely negative life experiences. Results also showed that respondents who identified as female were significantly more likely to respond that YAFC have a higher probability of an extremely negative life experience compared to the responses of respondents who identified as male. African American respondents were more likely than White and Asian/Pacific Islander respondents to believe that YAFC have a higher probability of one or more extremely negative life experiences. There was no difference between those who reported direct (personal or professional) experience in foster care and those who did not in their perceptions of the probability that YAFC have extremely negative life experiences.

Variable	Groups	M (SD)	Model
Age	45-54	3.96 (1.41)	F(5, 2195)=2.335*
	18-24	3.61 (1.39)	
Gender	Female	3.99 (1.32)	F(3,2186)=12.270**
	Male	3.64 (1.39)	
Race	African American	4.092 (1.4)	F(6,2191)=3.859**
	White	3.76 (1.29)	
	Asian/Pacific Islander	3.61 (1.43)	

Table 2: Likelihood of YAFC extremely negative life experiences as a function of demographic variables. *p<.05, **p<.01

The final set of analyses examined the relationship between media portrayals and perceptions of YAFC. The enter method of multivariate regressions found that media portrayals explain a small but significant amount of the variance for the perceptions that YAFC have been abused, neglected, prenatally drug exposed, poor, involved in

gangs, and subjected to sex trafficking (Table 3). The small size of the explanation underscores the need to examine other variables that mediate or moderate this relationship. For example, future research can examine patterns of the types of media that are most popular and influential for subgroups of the population. Yet, this result is meaningful because its statistical significance establishes that this research is on the correct path to understanding the relationship between media portrayals and public perception.

IV	DV	F	p	R2	Adjusted R2
Media Portrayal	Sexual abuse	14.70	.01	.03	.02
	Physical abuse	16.88	.01	.03	.03
	Parental neglect	25.88	.01	.04	.04
	Prenatal drug exposure	6.02	.01	.01	.01
	Poverty	20.65	.04	.04	.03
	Gang involvement	11.53	.01	.02	.02
	Sex trafficking	9.430	.01	.02	.02

Table 3: Likelihood of YAFC extremely negative life experiences as a function of media portrayals

More specifically, Tables 4a and 4b displays how each media portrayal is associated with public perception of the likelihood of extremely negative experiences for YAFC. Respondents who reported that media portrays YAFC as criminals were significantly more likely to report higher percentages of YAFC as having experienced sexual abuse, physical abuse, parental neglect, poverty, prenatal drug exposure, gang involvement, and sex trafficking. Perceptions of media portrayals of YAFC as victims significantly predicted the perception of higher percentages of YAFC who had experienced physical abuse, parental neglect, poverty, and lower percentages of sex trafficking. Perceptions of YAFC being portrayed in media as drug addicts significantly predicted the perception that higher percentages of YAFC are involved with gangs and media portrayals of YAFC as survivors significantly predicted the perception of lower percentages of YAFC involved in sex trafficking.

IV	DV	B	Beta	IV	DV	B	Beta
Criminal	Sexual abuse	6.033	.142**	Victim	Physical abuse	3.11	.07*
	Physical abuse	5.82	.14**		Parental neglect	6.17	.13**
	Parental neglect	5.77	.13**		Poverty	5.20	.11**
	Poverty	5.12	.12**		Sex trafficking	- 3.27	- .07*
	Prenatal drug exposure	3.65	.01**				
	Gang involvement	4.61	.11**	Drug addict	Gang involvement	2.01	.05*
	Sex trafficking	2.99	.07*	Survivor	Sex trafficking	- 3.34	- .07*

Tables 4a and 4b: Results predicting perceptions of YAFC extremely negative life experiences from perceptions of media portrayals (Scale of 1 – 100 with higher scores = higher percentage of YAFC who have had the experience). *p<.05, **p<.01

Conclusions

This representative sample of the general public in Los Angeles County not only documented their negative perceptions of how YAFC are portrayed in media, but our analyses also found strong links between those media portrayals and their negative perceptions of the experiences of YAFC. The majority of the sample had preconceived ideas that YAFC have been subjected to abuse, neglect, drug exposure, gangs, poverty, and sex trafficking. The respondents primarily felt concern (40%) and sadness (34.5%) when thinking about youth in foster care. In combination, these factors potentially contribute to a sense of hopelessness in the environments in which the children are developing a sense of identity. Children and youth who perceive that important/caregiving adults have low expectations for their outcomes, are more likely to fulfill that prophecy (Loeb et al., 2016). This alarming conclusion demands that we problematize how media frames the narrative about YAFC and take the necessary steps to prevent the public from further normalizing negative stereotypes of YAFC.

It is common for YAFC to hide their foster care status in their daily lives; perhaps, they do so because of these negative stereotypes. This raises the possibility that the participants have had a direct experience with YAFC more so than they realize. However, without that knowledge, those interactions cannot have had an impact on their perceptions of YAFC. This suggests that media is likely to be the primary tool by which most members of the public are exposed to the experiences of youth in foster care (Leber & LeCroy, 2012; Sims, 2018; Alvarez, 2017; Meese, 2012). We found no differences between respondents who reported personal/professional experience in foster care and respondents with no direct experience in their perceptions of the probability that YAFC have extremely negative life experiences. This result reinforces the idea that a lifetime of exposure to negative media portrayals of YAFC prior to career decisions is not dispelled (and may even be reinforced prophetically) by direct experience. We conclude that in order to counter preconceived negative perceptions of YAFC, specific content is needed to address this issue in the training programs for educators, social workers, foster parents, and so forth.

Implications for Practice: Meese (2012) proposed that in-service educators need specific training methods to promote inclusiveness in classrooms towards peers who have a foster care experience and that literature and films offer a tool by which to engage in those discussions and to counter negative stereotypes. Taymans and colleagues (2008) further argued that the dissemination of accurate information in preservice education programs for teachers will increase awareness and change the misperceptions that have developed through exposure to media. We conclude from our findings that programs to counter biases must impact all of the first order foster care environments and participants as well as second order institutions that support and supervise the development of children in foster care. Educators, social workers, and foster parents, as well as lawyers, mental health professionals, and physicians, and so forth all have the power to convey hopelessness or hopefulness when they interact with YAFC; without awareness of their implicit biases, they may be hindering rather than facilitating successful outcomes. Importantly, media producers must be informed of the power they have to inform rather than misinform the general public about the wider range of experiences and outcomes of YAFC.

The next step for this work is to produce appropriate content for an integrated curriculum intended to increase awareness, sensitivity, and the dissemination of accurate information for educators, social service professionals, and media producers. Our findings illuminated demographic differences in the perceptions of YAFC underscoring the need to consider demographics when planning professional development curriculum to counter biases. Taking these necessary steps will change the dominant narrative about children in foster care and alumni of the foster care system to provide a safer society for all people who grow up in a non-traditional family composition. With the creation of a movement to build awareness in the general public, we will move closer to a world in which all children are supported in their development of a positive identity based on their strengths and, therefore, build their capacity to achieve positive outcomes.

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What is Missing in the Process of Poverty Alleviation?

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Abstract
Taking alleviating extreme poverty as the top priority, the World Bank has conducted many projects in achieving this goal, such as increasing health, promoting educational access for girls, and so on (World Bank, 2018). All these projects that invest in human capital work to boost the economy and reduce poverty. However, a close look at the World Bank projects revealed that that ethics education is missing in these projects. Even though the Bank has its own Ethics Department guiding the behaviors of its employees, the projects it conducted in countries in poverty does not involve ethics education, an essential element in poverty alleviation. Other than explaining why extreme poverty exists and why certain groups of people keep returning to the poverty stage while receiving support from the government, this article takes China as an example based on scholarly publications to explain why ethics education is necessary in the World Bank poverty alleviation projects. Based on the literature review, this article argues that it is crucial to offer opportunities for those who do not have access to discover alternative lifestyles due to limited resources and low socioeconomic status and to facilitate people to determine a life goal in order to eliminate extreme poverty effectively.

Keywords: ethics education, poverty alleviation

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Introduction

Taking alleviating extreme poverty as the top priority, the World Bank has conducted many projects in achieving this goal, such as increasing health, promoting educational access for girls, and so on (World Bank, 2018). All these projects that invest in human capital work to boost the economy and reduce poverty. However, ethics education is missing in its projects. Even though the Bank has its own Ethics Department guiding the behaviors of its employees, the projects it conducted helping different countries in need does not involve ethics education, an essential element in poverty alleviation. This article takes China as an example based on scholarly publications hoping to explain why ethics education is necessary in the World Bank projects hoping to start a conversation about ethics education in poverty alleviation globally. It argues that ethics education is essential not only within the context of education but also in poverty alleviation worldwide.

Reasons of Extreme Poverty

First, it is essential to understand why extreme poverty exists and why certain groups of people keep returning to the poverty stage while receiving support from the government. Reasons that lead to extreme poverty varies in different parts of China (Tong, 2018). Previous statistics show that the first one is living in an extreme natural environment. Other reasons include no income and working abilities due to disabilities or diseases, disconnected with society, experienced disasters, or chronical diseases that require much financial support. Even after receiving assistance from the government, these people are the ones with high possibilities of returning to poverty after spending financial aid (Tong, 2018). According to Lv (2001), those who cannot handle the difficulties in life and those with an inferiority complex are the ones who tend to give up. Thus, most of them depend on the support of the government entirely. Besides, due to lacking educational experiences, some people consider living in a disadvantaged geomantic omen (Feng Shui, 风水) places as the only reason for poverty. Thus, they give up on working to change the situation. A glance at all these reasons, it is evident that some people do have the ability to work and improve their economic status. However, they give up mentally.

It is crucial to notice that some people have developed an inert desire to always ask for help from others rather than working to change the situation. This phenomenon could be an inevitable obstacle of alleviating poverty because the resource is limited, and the inert desire will be a black hole that could never be filled up. Besides, no one is responsible for being the donator throughout his/her life. Only when everyone works together towards the same goal can extreme poverty be alleviated entirely. Thus, ethics education is essential in the World Bank projects and countries that are in poverty to achieve sustainable development for all.

The Chinese Way

To reach sustainable development, the Chinese government is resolute in eliminating poverty with various methods. For instance, besides emphasizing on helping the disadvantaged household in starting a business by providing more resources, there is also a strict responsibility inquisition system on government officials. According to the State Council Information Office of the People's Republic of China (2016), the

poverty alleviation policies are strict on government officials so that they will keep up with the fast pace of the task. Infrequent visits to the household in poverty or delays in implementation of new policies could lead to severe punishment such as circulating a notice of criticism of the individual or, even worse, dismissing from the position (The State Council, 2016). The strict responsibility inquisition system has both positive and negative effects on this campaign. On one side, it shows the determination of the government in helping those who are in need and brings hope to the beneficiaries.

On the other hand, government officials who are doing this task will become cautious and reluctant for this job to avoid possible punishment once something goes wrong. Rather than giving too much pressure on people who are helping, it is necessary to help people who are in need to develop into a whole person first. They must learn to be a giver rather than a constant receiver so that more people could benefit overall.

Fu Pin Xian Fu Zhi

For people who have abilities to change their living situations but are psychologically defeated by life, ethics education might help to regain their confidence. Assisting those who are in poverty in setting a life goal could potentially help to change their lifestyle and motivate them to strive for a better life. According to Wang Yangming (2017), people will always remain a passive attitude towards life before setting at least one life goal. Setting a life goal involves two significant components. The first one is the virtue, as the one mentioned in Daoism, i.e., to be benevolent to others (Lao Zi, 2015). With virtue, the individual will think and act based on an ethical standard. Thus, goals like "I want to be a successful theft who can steal all kinds of diamonds and will never be caught by the police" can be avoided.

The other component is that the individual needs to have sufficient knowledge to assist him/her in setting a life goal. Living in extreme poverty, many people have little resources and few opportunities to learn the categories of occupations and the variety of lifestyles. This situation leads to the results that many pay great attention to the limited resource they have and continuously have disputes because of the resources, such as land, which is distributed to them by the government (Bai, 2007). That is why many scholars (Jiang & Wan, 2004; Li & Zhu, 2016; Lv, 2001) who are interested in poverty alleviation argued: "Fu Pin Xian Fu Zhi" (扶贫先扶志, meaning it is crucial to help people determine a life goal before eliminating poverty). However, this is not an easy task at all.

What is Ethics Education in the Context of Poverty Alleviation

A few discussions with the students at a prestigious university in China show that some of them are reluctant to ethics education because they believe ethics education will limit their freedom of desire and behavior since it may bring new rules to their life. Most of them have a negative view of ethics education. Even though specific courses, such as A Survey of Mao Tsetung Thoughts and Theory of Socialism with Chinese Characteristics (毛泽东思想和中国特色社会主义理论体系概论) are classified as the formal ethics education curriculum, it is not favored by most students although they have to show up in class. Some students mentioned that they usually utilized the lecture time to work on assignments from other courses while the instructor was teaching in front of the classroom. Students indicated that this course

does not expand students' views towards life, nor does it help students to set a life goal even though it is classified as an ethics education course.

My interactions with these students provide an insight into the priority of Fu Pin Xian Fu Zhi, which is to have a correct understanding of ethics education. The misunderstanding that ethics education will only bring more rules and limit people's freedom does not only exist among students but also presents in other populations, such as the Communist Party members. Since they are the officials who will get involved in the marketing of ethics education, a correct understanding is essential. Ethics education, which is different from the common perception, is the education that develops students' ethical awareness and supports people's decision making whenever an individual come across any ethical circumstances. It is not merely about telling people what is right and what is wrong. It facilitates human beings to find the meaning of life with sufficient knowledge and to become a person who is benevolent to the society so that everyone works together to promote sustainable development. The development will never become sustainable if specific populations keep receiving financial support from the public without giving back to society.

More to be Discussed

How to deliver ethics education remains a question that needs further research. According to a few scholars (Jin, 2017; Huang, 2018), one of the challenges in current ethics education in higher education institutions is that the course materials are not closely related to students' daily life; another reason is that the instruction methods is singular that the courses are always dull and unaccepted by students. Thus, in order to successfully bring ethics education to those who are in poverty, especially for those who are at around 50 years old and have their view of ethics, the approach of introducing ethics education has to be innovative and does not aim at controlling people's minds in order to avoid reluctance of participation. One suggestion is to design shows or performances that incorporate case studies to let people know that there are alternative ways of living a life rather than giving up on themselves and waiting for government assistance. These activities should be hosted by scholars with correct understandings of ethics and are not eager to brainwash the innocent receivers. Overall, it should offer opportunities for those who do not have access to discover alternative lifestyles due to limited resources and low socioeconomic status.

Conclusion

It is necessary to mention that "the meaning of life" is an abstract and complicated concept. No one in the world has a clear answer to it yet. Thus, there is no reason to force people in poverty to think about it clearly and find a solution at once. However, it can be replaced by another question, as suggested by Anthony Kronman (2007), which is what one should care about ultimately in life. Thinking about this question may arouse people's interest in finding more joyful possibilities rather than living a miserable life with limited resources to survive. Even though this article might be limited since it is built upon literature instead of practical experience in poverty alleviation, the author still wants to promote a discussion on ethics education and poverty alleviation not only limited to any specific country but also globally.

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Legitimate Peripheral Participation (LPP) in Community-based Child-rearing Support Centers (CCSCs): Focusing on LPP Developing Process through Multiple Interactions among Parents in CCSCs

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Abstract

Legitimate peripheral participation (LPP) represents how newcomers become experienced members and eventually experts of a community of practice (Lave & Wenger, 1991). The purpose of this study is to investigate the developing LPP process in Community-based Child-rearing Support Centers (CCSCs) through qualitative research on the process that the participants (parents) experience mutual communications and acquiring knowledges and skills. The Japanese government has expanded child-rearing support via the CCSCs in recent twenty years. They are open spaces for infants and parents in the community, where they can gather freely, communicate with each other, and share their anxieties and worries related to child rearing. We observed that various types of social exchanges are prevalent among the participants including intern students and senior citizens in CCSCs. These kinds of practices embody the idea of the "socialization of childcare" by sharing it among families and people in the community. A community of practice is evolving naturally because it is through the process of sharing information and experiences with the group that parents learn from each other, and have an opportunity to observe the practices of volunteers and expert workers, and thereby to understand their own worries from another point of view. As the results of these interactions, some parents become the full time workers of CCSCs later. The results of this study show that these LPP empowering processes are important functions of CCSCs and CCSCs require to foster community of practice and involve broader community people in CCSCs.

Keywords: Legitimate Peripheral Participation, Community of Practice, Situated Learning, Community-based Child-rearing Support Centers

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Introduction

Trends in Birthrate in Japan

The annual number of live births in Japan was about 2.7 million in the first baby boom, about 2.1 million in the second baby boom, and in 1975, it fell below 2 million, and has continued to decrease every year since then. The number of births in 2016, which was 976,978, fell below 1 million for the first time since records began in 1899. The total fertility rate, which exceeded 4.3 during the first baby boom period, has rapidly fallen since 1950. In 1989, the rate was 1.57. Yet, in 2005, the rate fell to 1.26, the lowest on record. Although the total fertility rate has shown slight increase in recent years, in 2016 it decreased by 0.01 point from 1.45 of the previous year. The total fertility rate in some countries (France, Sweden, the US, the UK, Germany and Italy) declined from 1970 to around 1980 as a whole. In some countries, however, the rate has recovered since around 1990. Looking at the transition of the total fertility rate in Singapore, Republic of Korea, Hong Kong, and Taiwan among the countries and regions in Asia, all maintained a level higher than Japan as of the year 1970. However, they have shown a declining trend, and today the total fertility rate in these countries and regions falls below the replacement-level fertility rate (Cabinet Office, 2019).

The reasons for low birthrate in Japan

In the late 1970s, the rate of unmarried women in their twenties increased sharply, and late marriage began, as the age of marriage increased, and in the 1980s, the rate of unmarried women in their 30s and older also increased. As a result, she became unmarried along with her late marriage. Furthermore, as deflation has become chronic, the economic base has been high, with the unmarried rate of men with low income and unstable employment being high, and the rate of unmarried women working in workplaces where non-regular employment and childcare leave are not available is high. The rise in low-wage non-regular employees due to deflation may be accelerating unmarriage, as future prospects and stability of employment and career will affect marriage (Cabinet Office, 2019).

The Equal Employment Opportunity Law was enacted in 1985, and while women have advanced into the society, there is a difficulty in balancing work with the lack of a childcare support system. Higher incomes (opportunity costs) may also influence the choice of having children. Although the majority of infants are cared for by mothers at home, the double-income and one-parent households have been remarkably increasing in Japan. Among the households with children under 6 years of age, nuclear families with a working father and a non-working mother account for 43.4% and reach 49.1% among households with children under 3 years of age (Japan's national census, 2010).

On the other hand, it is pointed out that long-hour work practices keep Japanese fathers away from childcare. Fathers in families with children under 6 years of age spend 39 minutes a day for childcare on an average while mothers spend about 3 hours. Also, there is a considerable gap in the take-up rate of childcare leave between women (81. 5%) and men (2. 65%) in 2015. These facts imply the unequal distribution of childcare responsibilities by gender as well as the existence of a

constant number of mothers who are taking care of their young children at home. Meanwhile, mothers who are devoted to child rearing lose their social networks and become isolated, and the "child-rearing anxiety" such as being seized with the vague anxiety about child rearing and sometimes maltreating a child, has become a social problem (Kudo, 2017). Although "child-rearing anxiety" and "isolated child rearing" had been recognized as problems among full-time mothers, the support for these parents was not established immediately. Therefore, it becomes an important policy issue in Japan to develop a support system necessary for child-rearing and to create a social environment where children and their families can interact with neighborhoods and local communities.

The purpose of this study and methods

The Community-based Child-rearing Support Centers (CCSCs)

Our studies focus on the processes of parent's participation in Community-based Child-rearing Support Centers (CCSCs) which constitute a typical childcare support measure for parents especially who look after their young children at home. CCSCs are open spaces where children and parents can gather freely, communicate with each other, and share their anxieties and worries related to child rearing. The prototype of CCSCs was introduced in some nursery centers in the early 1990s aiming to respond to anxieties or worries families in the community. Moreover, in 2002, the "Tsudoi-no-Hiroba" (Gathering Places) programs were established. They were set up in public facilities, community centers, vacant stores, private houses, and apartments etc., to provide places for parents to gather with infants and promote their interactions on child rearing by facilitating the use of volunteers in the community.

Although CCSCs were reorganized and their categorization changed in 2013 and 2014, the fundamental services offered by CCSCs are as follows: (1) to provide spaces for children and parents and promote exchanges, (2) to implement consultation and assistance for child rearing, (3) to offer information related to childcare in local communities, and (4) to provide classes in child rearing and childcare support (Kudo, 2017). Basically, CCSCs are publicly subsidized and open for more than 3 days in a week, and 65% of the CCSCs are open 5 days a week. Its number increased continuously and amounted to 7,431 in FY2018. As the average number of parents using CCSCs per day is 17.3 pairs, the average number of staffs per day is 3.1 (National council of CCSCs, 2018).

Legitimate peripheral participation (LPP) as a theoretical framework

The theoretical framework of our studies is "legitimate peripheral participation" (LPP) which is a model that describes how newcomers become experienced members and eventually old timers of a community of practice or collaborative project. The concept was first proposed by cognitive anthropologist Jean Lave and educational theorist Etienne Wenger in their 1991 book Situated Learning (Lave & Wenger, 1991). Lave and Wenger proposed the LPP theory through their case studies on apprenticeships. The theory identifies learning as a contextual social phenomenon, achieved through participation in a community of practice, is different from teaching curriculums in schools and is not an individual achievement for acquiring knowledge and skills. Newcomers become members of a community initially by participating in

simple and low-risk tasks that are nonetheless productive and necessary. Through peripheral activities, newcomers can directly observe the practices of community members and become acquainted with the tasks, vocabulary, and organizing principles of the community's members. Membership in a community of practice is mediated by the forms of participation to which newcomers have access, both physically and socially. The old timer has both the power to confer legitimacy to the newcomer, and to control their level of access to experiences and resources.

According to LPP theory, learning is a process of identity-formation towards becoming a full member of a community of practice, or towards full participation from peripheral participation. Thus, learning is part of the participation in the community of practice and at the same time is viewed as relational. Lave and Wenger point out: "In this regard, learning, thinking, and knowing are the relationships of those who engage in activities that are with and arising from the world in a socially and culturally structured world. This world is socially composed." Here, there is criticism of the individualism-based view of learning, which has regarded the process of knowledge internalization as learning (Matsumoto, 2006).

Another key concept is "community of practice" (CoP) which is a group of people who share a craft or a profession. It is through the process of sharing information and experiences with the group that members learn from each other, and have an opportunity to develop personally and professionally (Lave & Wenger 1991). CoP can exist in physical settings, for example, a lunch room at work, a field setting, a factory floor, or elsewhere in the environment, but members of CoP do not have to be co-located.

In Japan, we have some previous studies concerning LPP and CoP, such as, community hall activities (Matsumoto, 2016), lifelong learning (Matsumoto, 2006), disaster education (Yamori, 2015), independent living movement of person with disabilities (Inose, 2008) and so forth.

The purpose of this study is to investigate the developing LPP interactive processes in Community-based Child-rearing Support Centers (CCSCs) as one of the CoPs. We adopt qualitative research method focusing on the processes that the participants (parents) experience mutual communications and acquiring knowledges and skills and we observed that various types of social exchanges are prevalent among the participants and staffs including intern students and senior volunteer citizens in CCSCs.

Results and Discussions

LPP processes in CCSCs through Participant's (Parent's) voices

National Council of CCSCs collected the stories, poems, and episodes from users, staffs, and volunteers in CCSCs (National Council of CCSCs, 2010). We analyzed the content of these submitted works (voices) in order to investigate LPP processes from the following various aspects. We consider that these voices are expressing directly the parent's feelings in the process of coming to and staying in CCSCs. Their anxieties about raising children are gradually resolved by passing through the gates of the open space/center and are gradually able to have a wider view in inter-relations

with other parents and then able to get a feeling of being connected to communities.
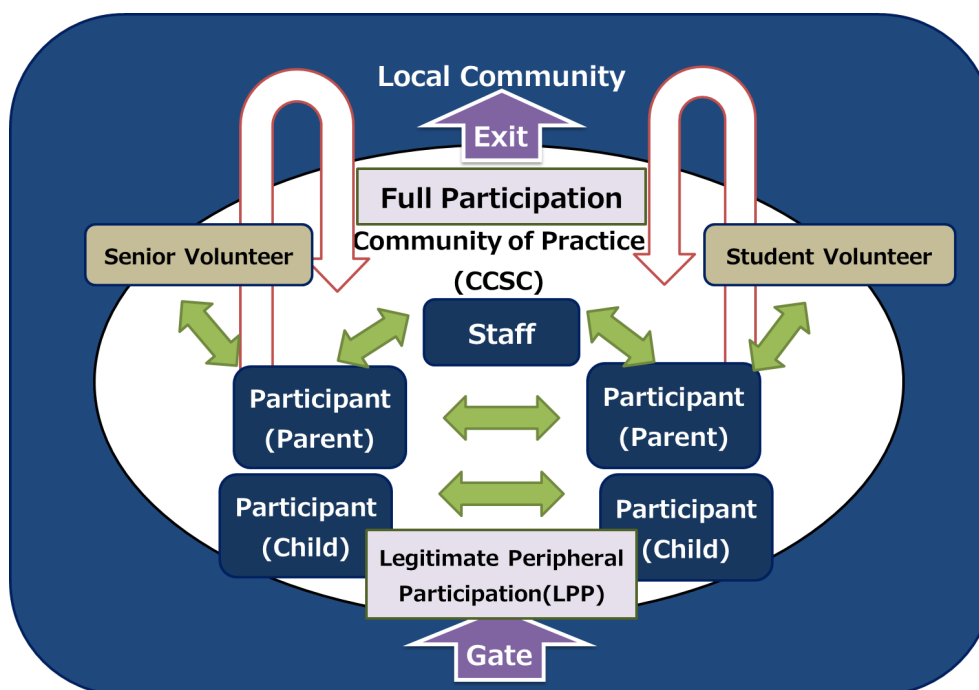
Figure 1: Framework for investigation on LPP in CCSCs

1) Anxiety about raising children before coming to CCSCs

"As a new mom, I couldn't understand my son's behavior and was very depressed. Is it because of my nurturing?"
"Every day at home alone with a child. I envy moms with children outside. I and my child want friends."
"Repeated moves, care for two children, isolation and loss of confidence in unfamiliar town."
"I couldn't go out for a while because of postpartum depression."
There are so many mothers who visit CCSCs after exhausting their physical and mental well-being and struggling for the first time to raise children who do not follow the childcare book.

2) Open the door into CCSCs

"Thanks to mom for calling out at the beginning. How happy was I?"
"I was saved a lot by talking about everyday stories. I had been making a meaningless wall."
"I'm happy that moms treat me as one of them with respect."
As even those who use CCSCs as usual almost every day, opening the door of CCSCs for the first time seemed to be very courageous step for them. Therefore, the setting of programs and events can facilitate to visit CCSCs.
"After the baby massage, we can have time to introduce ourselves and talk about our concerns."
While experiencing failures and hesitations, my son waited for time at his own pace. I gained courage in the presence and guidance of my friends.
By planning and running events involving participants (parents), parents can feel that

these events are their own events for themselves.

3) Relationship among participants (peers)

"The voices of peers in the same environment are more helpful than any kind of childcare book, and I feel like I'm not alone."
" Talking session could deepen the bond with my child. As I realize that I can play a role in CCSC, and also I can help other mothers through talking. I think this confidence lead to my growth."
There are many cases where not only the staff members do everything but also the involvement of the parents into planning and operating programs can confer them a sense of fulfillment and accomplishment.

4) Relationships between participants and staffs

"With the smiles of the staffs, I was able to laugh little by little. My world has regained its color."
"As the staffs welcomed me gently with a warm smile at the center, I was able to lessen my anxiety and tension. My heart was filled with peace of mind."
"At the salon I visited after a long time, the words "welcome home" from a staff. I felt that my frozen heart melted unexpectedly."
"'You can't raise a child by yourself alone, don't carry the burden.' The staff encouraged me without blaming me. The center taught me everything important about raising children."
There were many voices that clearly expressed the significance of having staffs always there. We can observe a warm exchange of hearts between parents and staffs.

5) Relationships between participants and community people

"A volunteer as old as my father gave a gentle voice to me while taking care of the plants."
"I feel very happy that the child I've been holding has grown and is playing with his mother." (a volunteer's voice)
In CCSCs, the parents are given the warms from senior volunteers, but at the same time, senior volunteers also can have the synergistic effect of receiving motivation, enthusiasm, and rewarding from parents and children.
"University student volunteers who were like older sisters came and played with everyone."
As there are many opportunities that junior and senior high school students volunteers as vocational experiences in CCSCs, the students themselves hold a baby first time. These experiences bring them valuable images of raising children.

6) Building identity

"Anxiety was removed during the encounter to other mom and I was getting confident in childcare. I'm growing up."
"I changed my life and my feelings about childcare by 180 degrees here in another home-like place."
"I met a mom holding the same troubles and thought that it was not just me, not just my child, and I really wanted to do my best."

"I volunteered what I could do for moms and then became a staff member at CCSC."
There is no single correct answer in child-rearing. Parents are getting able to face the irreplaceable life in front of them without comparing other children.
"One mom has set up a circle joining by moms who have twins, created a textbook, formed an OG meeting, and followed up new twins moms."
"At the recommendation of the center's staff, she launched a child rearing circle and created a local childcare information magazine for junior moms."
Moms are able to learn and encourage each other and children also play by watching someone's example among them and with various adults, as if they were a big family.

7) Third place

"I feel like staying in home where big family has so many children and I feel the warmth just like someone is always there".
"I realize that moms are looking for a place to relax and can be themselves".
In community building, "third place" is the social surroundings separate from the two usual social environments of home ("first place") and the workplace ("second place") (Oldenburg, 1989). "Third places" are important fields for civil society and establishing feelings of a sense of place. CCSC can be regarded as one of third places in child rearing.

8) Boundaries between CoP and broader local community

"Elderly people in a passing area come to CCSC and hold babies or talk to babies."
"There is a bus stop near the entrance of CCSC and bus users say something to parents and children."
"Sometimes mother and children visit neighboring day service center for the elderly and have communication with them with handmade gifts."
There are various social resources around CCSC. Shopping streets, neighbors, various local groups, local governments, and so forth. CCSCs can play a role as local childcare support bases only if they are properly open and connected to local communities.

Conclusions

Summary of Results

There are many diverse communities of practice in a local community. We describe the changing process of participants (parents) through LPP within CCSCs as community of practice. Participants can be transformed from new comers to old timers through legitimate peripheral participation (LPP) within the community of practice. An important part of changing participants is the acquisition of identity and the resulting empowerment. The Community-based Child-rearing Support Centers (CCSCs) can be viewed as a child care community of practice, and is a place to encourage change of participants (growth as a parent) and has the power of the place. This kind of "power of third place" is created by the interaction between participants and staffs, and participants and local people and also among participants (parents). Thus, CCSCs need to be open to new parents and widen their entrances and require to foster community of practice. Furthermore, CCSCs should involve broader community people and should have cyclical interrelation with local communities.

Implications for child rearing social policies

In order to alleviate the burden of child-rearing and enhance social support for parents, it is important to ensure parental communication and interaction such as involving parents into planning and managing programs in CCSCs. We find out that these kinds of participating processes regarded as Legitimate Peripheral Participation (LPP) are key factors for operating programs of CCSCs. CCSCs are institutional communities stipulated by law. They are operated mainly by public sectors and are financed mostly by the governments. There are institutional, legal, and financial grounds, frameworks and standards in managing CCSCs. Nevertheless, for their effective operation, CCSCs should be managed as communities of practice (CoP) including informal interrelations with local communities. As the prototype of the CCSCs was born in non-profit organizational activities by citizens (parents themselves), their viewpoints and user-oriented operations including LPP processes should be in considerations as child rearing social policies.

Implications for creating a child friendly society

The boundaries between communities of practice and local communities are ambiguous because the participants (parents) take part in one community of practice such as a CCSC are also residents in a local community. The boundaries are not clear lines. In one local community, there are a variety of communities of practice. We could say that the CCSCs are one type of community of practice. The interrelations between CCSCs and local communities we described here have some influences on not only the nature of CCSCs but also the character of local community. If the institutional communities like CCSCs have good influences on their society, we could say that the other types of institutional communities (nursery schools, kindergartens, elementary and junior high schools, children's house) must be able to have some good influences on their society by incorporating LPP processes which can be easily participated by parents, children, and residents. We identified that the social role of CCSCs is to transform a local community where CCSCs are belonging to into a child-friendly society.

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Korean Undergraduate Students' Language Learning Strategies in English Medium Instruction Courses: A Case Study

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Abstract

English Medium Instruction (henceforth, EMI) in university courses is expected to have positive effects on university students' English language learning in non-English-speaking countries since they can learn English on campus (Macaro, 2018). For successful second language (L2) learning, efficient use of L2 learning strategies is essential (Oxford, 2017; Cohen & Wang, 2018). The goal of this study is to investigate, through qualitative research, how the experiences of EMI impact students' learning strategies for effective English learning. The data for this research were collected through class observations of 88 students in two EMI classes and in-depth interviews with two focus groups of five students and instructors at a Korean national university from April, 2019 to June, 2019. One of the classes was for first-year students who were taking an EMI course for the first time and the other for second or third-year students who had taken more than two EMI classes before. My data analysis has brought out the following findings: (1) students who had taken more EMI classes used more learning strategies than the others, (2) students used social strategies more often than the other strategies to understand complicated subject matters such as syntax, and (3) students combined different strategies to increase their understanding. The conclusion this research leads to is that students perceive EMI courses as effective and helpful for their English language learning and that more experiences of EMI can increase their use of learning strategies, which would facilitate their English learning.

Keywords: internationalization, English Medium Instruction (EMI), L2 learning strategies, immersion education, higher education

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Introduction

Due to globalization, English has been recognized as an important tool for international communication. One of the goals in English education is to help people to develop communicative competence of English so that they can communicate with people from other countries in English as global citizens. With this global trend having led to the requirement that students reach a higher level in English language ability and that educators teach English as a global language, English Medium Instruction (EMI) as content-based instruction emerged in Korea and other Asian countries such as China, Japan, Malaysia, and Taiwan between the late 1990s and the early 2000s (Naun, 2003). Korean universities implemented EMI courses as a means of higher education to improve their students' English skills as well as to enhance their readiness for the global job market because Korean students learning English as a foreign language (EFL) in Korea hope to be able to acquire high English proficiency with which they can communicate well with people from other parts of the world (Byun et al., 2011).

For this research, I examined how Korean university students' learning is impacted as they learn their major subjects through EMI courses. I conducted data collection to investigate how Korean undergraduate students enrolled in EMI courses at a national university in Korea study to learn English as L2 (L2: a second language), and how they use their learning strategies for attaining academic English proficiency while taking the EMI courses. I scrutinized how they study their major areas under the EMI policy and examined their language learning strategies in the EMI courses because language learning strategies are key factors in successful second language acquisition (Oxford, 1990, 2014, 2017; Cohen, 1996, 2012; Cohen & Wang, 2018).

Rationale

There are various approaches to English education. The content-based approach is one of them. EMI is a kind of content-based approach which is considered as a way of helping students who learn English as a Foreign Language (EFL) or English as a Second Language (ESL) to develop or improve their English abilities while taking classes. It is an alternative to prototypical immersion learning, but its effectiveness differs depending on the context (Swain & Johnson, 1997). In Korea, EMI courses are expected to have positive effects on bilingual education from a pedagogical standpoint because Korean children and students can learn English with no risk of losing their mother tongue Korean. Also, their identity as Koreans remains intact because they learn English at an institution within their home country. The evolving sociopolitical contexts of EMI courses implemented in Korean universities are closely related to globalization, which has had an impact on English language education in the country since English as a lingua franca has come to have significant political and social influences on communities worldwide (Crystal, 2006; Durham, 2014).

Since English communication ability is perceived as crucial in Korea, Korean students have greatly endeavored to acquire English so that they can communicate well in the language. Many Korean students go abroad to study in a country where English is a native or official language, hoping that gaining the experiences of being immersed in such an environment would help them to acquire English in a short time. However, it often turns out to be impossible, as pointed out by Combs (2012), who argued that

"There is still no evidence that children can learn a second language well in just one year, regardless of the approach used" (p. 80). Moreover, the students' parents have been willing to make sacrifices to support their children's studies and English acquisition in an English speaking country, taking on massive financial burdens regardless of their socioeconomic status. Unfortunately, many parents' efforts to help their children acquire English in a short time were unsuccessful, resulting in their families being left in financial debt due to the high expenses for the students' education overseas. These situations led me to inquire about how Korean students are studying English at a university in their home country where EMI courses are taught to undergraduate students by Korean professors. In this study, I looked into how beneficial Korean undergraduate students consider EMI courses, and whether they find opportunities to access academic English in EMI courses helpful for the improvement of their English abilities in college. Moreover, this study will provide new information about the challenges and issues EFL students encounter in relation to their learning strategies in EMI courses, showing how their learning strategies contribute to the enhancement of their motivation and the achievement of their goal of improving their English skills.

Theoretical Frameworks

This research is grounded in the theoretical framework of comprehensible input in second language learning (Krashen, 1985, 1989) and the sociocultural approach to second language development (Lantolf, 2000; Lantolf & Appel, 1994; Lantolf & Thorne, 2006) as well as the conceptual framework of higher education in EMI courses (Macaro, 2018). Researchers have argued that English medium education such as EMI courses, immersion or bilingual programs in multilingual settings can provide an enriching repertoire to linguistically homogeneous English learning students through the maximal use of the target language (Swain & Johnson, 1997; Swain & Lapkin, 2013). Nonetheless, while direct exposure to the target language L2 is important, how much students comprehend L2 is just as critical. According to the Input Hypothesis (IH) in second language acquisition research, comprehensible input with consistency is an essential environmental factor for successful second language acquisition since students are believed to naturally acquire a second language by receiving comprehensible input in their learning environment (Krashen, 1982, 1985). This study is designed to examine how Korean university students' language learning strategies are utilized for attaining comprehensible input in addition to how their language learning strategies and their L2 development are associated with the EMI courses.

Children can develop and build their language competence through sociocultural interactions in social environments (Vygotsky, 1978). Vygotskians (Swain & Lapkin, 2013; Lantolf & Appel, 1994) extended Vygotsky's theory of mediation to children's language learning and development. One of the conceptual approaches to the learners' interactional strategies involved in language learning is a sociocultural theoretical perspective on second language learning, which theorizes a mediation of sociocultural interaction. Within EMI classrooms, students are to interact with their teacher and peers in English, which is their L2. From a sociocultural perspective of language learning, the learners' communicative interactions can contribute to their L2 learning.

Many scholars have conducted research on language learning strategies to identify social language learning strategies employed in various sociocultural contexts (Donato & McCormick, 1994; Oxford, 1990, 2014, 2017; Cohen, 1996, 2012; Cohen & Wang, 2018; Ellis, 1997; Macaro, 2001; Reiss, 2011). Oxford (2014) stated that language learning strategies in relation to diverse learning circumstances and individual differences have complexity and flexibility. English Language Learners (ELLs) often use strategies related to specific attitudes or techniques intentionally to improve their English skills. These strategies are associated with increasing their motivation and self-regulated learning (Ames & Archer, 1988; Dörnyei, 1998). Social strategies are considered to be effective in making L2 language learning less stressful and fun. Likewise, EFL students' social language learning strategies in both individual work (e.g., trying to speak in L2 more often with peers or pay attention to what other students say) and group work (e.g., studying with friends to finish their course task or homework and/or reading the textbook together with classmates) are intended to provide the students with opportunities for sharing opinions or cooperating with their peers (Reiss, 2011).

Research Questions

This study presents how Korean university students' language learning strategies were practiced and changed when encountering difficult situations and challenges in understanding the content of English lectures. I scrutinized and analyzed the data I had collected by surveying two EMI classes with a questionnaire and conducting classroom observations and in-depth interviews. For this research, I developed such research questions as follows:
1. How do EMI courses at a Korean university affect undergraduate students' language learning strategies to understand the content of English lectures?
2. What language learning strategies do the students adopt to obtain comprehensible input? Why?
3. What differences are there in the use of the students' language learning strategies when they work in a group and individually?

Methods/Design

EMI is one of the alternative ways of English education adopted in Korea which is intended to challenge Korean students to develop and enhance their English communicative competence and capacity of becoming global citizens. To find out how effective EMI courses are, what problems they have, and how to overcome them, it is necessary to research English learners' perspectives of EMI courses. For this purpose, I conducted a case study (Merriam & Tisdell, 2015; Yin, 2017) on two undergraduate EMI courses at a Korean national university through a qualitative research methodology to look into the categories of the students' language learning strategies in the process of their L2 learning and how they perceive the effectiveness of the EMI classes for the improvement of their English proficiency. I analyzed the students' language learning strategies and scrutinized my data from the learners' perspectives to find out how they prepared to study as well as how they resolved the difficulties they encountered in the EMI classes. I examined how they use their language learning strategies to improve their English abilities in such a social setting as an EMI class at a university in Korea.

The EMI courses aim to (1) improve the students' four skills of English: listening, speaking, reading, and writing by teaching the major subjects in English, and (2) foster and enhance their competence of academic English. With this research, the Korean undergraduate students will have an opportunity to look into their own experiences in an EMI course and their language learning strategies.

Participants

I conducted my research at a Korean national university, which is a flagship national university in South Gyeongsang Province, Korea because the school provides EMI courses for undergraduate students. I selected 88 students to collect data on their perspectives on the EMI courses during one semester. The participants in this case study are freshmen, sophomores, juniors, and seniors. Although the courses were mainly for the students who were majoring in English Language and Literature, they were open to other majors, also. The students earned three credits by taking these courses. The students enrolled in the EMI courses listened to the professors' lectures given in English more than 90%. When taking the EMI courses, the students met in a classroom three hours every week, participating in class presentations and group discussions.

Data Collection

This research is a case study of two EMI courses at a national university in Korea, which was conducted by focusing on the learners' perceptions and strategies to acquire English. For data collection, I conducted a questionnaire survey, class observations, and interviews with 10 students and 2 professors in the two EMI classes at the university. I observed the EMI courses once a week for three months to see how the students behaved in the EMI classes and looked into their English language learning strategies. I conducted uncontrolled non-participant observations for my data collection to find out how the students in the two EMI classes performed their learning strategies when interacting with their professors and their peers on a weekly basis from April to June 2019. I observed the students' participation in the EMI classes, focusing on how they listened to the professors' lectures delivered to them in English, how they asked questions and engaged in discussions, and how they engaged in individual and group work.

Data Analysis

The theoretical frameworks that I adopted in this research facilitated my data analysis and interpretations to examine how the EMI courses can benefit linguistically homogeneous English learning students with the maximal use of English as their target language. I utilized theories of language learning strategies in second language acquisition (Oxford, 1990, 2014, 2017; Cohen, 1996, 2012; Cohen & Wang, 2018; Reiss, 2011) to interpret my findings of language learning strategies into four categories: metacognitive, cognitive, social, and compensatory strategies. I conducted a qualitative analysis of the data from the observations, interviews, analysis of the data from focus group interview data, classroom observation recordings, field notes, and the students' works in the EMI classes. Afterwards, I conducted data-driven coding for the data including the interviews that I had transcribed, finding common themes across the collected data, according to the codes I had created, and categorized

the data along with their characteristics in relation to my research questions (Gibbs, 2008). Subsequently, I analyzed the overall data.

Results

The findings from the focus group interviews were integrated with the information collected from the class observations. From the data analysis, three themes emerged from the findings of this study, which were related to the use of the students' language learning strategies in the EMI learning for obtaining comprehensible input.

1) Use of more language learning strategies (henceforth, LLS) in EMI

Students used more language learning strategies (LLS) in the EMI than in the non-EMI classes. This is because EMI is an immersion instruction conducted in English only for the Korean students. Naturally, the EMI courses were harder for them, so they had to study more in the EMI than in the non-EMI courses. Oxford (1990) stated that "[l]earning strategies are specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (p. 8). Students described how they did in EMI as follows:

Table 1 *Students' Descriptions*

Student A: "I have to study more with various learning strategies in the EMI course than in
      my first language instruction courses. It's hard for me but it's English
      immersion learning."
 	
Student B: "After the EMI course, I always reviewed what I learned and marked what I did
      understand or need to learn more before I forget. In comparison to the Korean
      instruction class, EMI is much harder for me and English instructions are
      easily forgettable, so I have to study more."

Figure 1. How I did in EMI
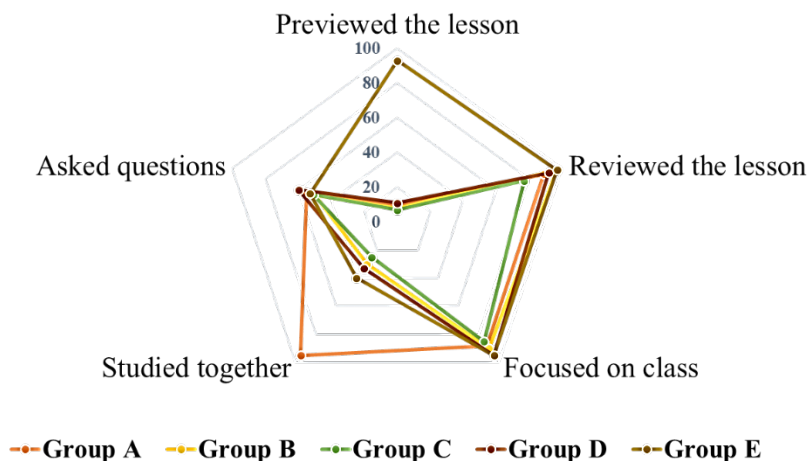
The graph in Figure 1 above shows what ten students in the focus group did more in the EMI than in the non-EMI courses. In the EMI classes, students had higher motivation for English learning to improve their English abilities. They did more reviews for the class lessons, were more focused in class, and studied terminologies more in the EMI classes than in the non-EMI classes. However, there were differences found in previewing among the students. For example, only two students did a preview for most of their EMI classes, that is, over 90% of the classes during the spring semester while others did a preview for less than 20% of the classes. Most students stated they studied alone in preparation for the EMI classes while only two students mentioned they preferred to study together with their classmates.

2) Use of social strategies for complicated subject matters

It has been brought out that students use social strategies when faced with complicated subject matters.

Table 2 *Students' Descriptions*

Student C: "I prefer a group study"
Student D: "When I study with my classmates, I can ask one of them about several things I don't understand or missed in EMI class"
Student E: "We study together to share the content of EMI because it is too much for me"

3) Integration of different LLS to increase their understanding in EMI courses.

Additionally, it was found that students used different strategies. For example, they used not only cognitive language learning strategies, taking notes of key points, but also social language learning strategies, by listening carefully to what their peers say and asking the professor and/or students questions in the EMI classes. The students said, "I study alone for reviewing, but I study together for a difficult EMI course", showing that they used social language learning strategies as well as cognitive language learning strategies. My participants were the students who began learning English from elementary third grade under the 7th curriculum. Therefore, they have kept studying English since they were around ten years old.

When in high school, they used only cognitive language learning strategies such as taking notes of key points or making summaries of new information, but while taking EMI in college, some students made study plans and some students noticed that there were gaps or weaknesses in their English. They stated, "I developed my high school English language learning strategies further and used more strategies while taking EMI in college." Therefore, it could be inferred, from my in-depth interview analysis, that the students integrated cognitive LLS with metacognitive LLS or integrated cognitive LLS with compensatory LLS to increase their understanding in the EMI courses and improve their English abilities.

Conclusion

With the data from a case study focusing on college students' perceptions about the effectiveness of EMI and their language learning strategies in the two EMI courses at a national university in Korea, this research has shown how Korean university students endeavor to enhance their academic English competence with the use of various learning strategies. Additional research on EMI courses will be needed at various levels to further identify students' English language learning strategies and their roles in the development or improvement of their English proficiency. It is important to look into how students are studying and how their learning strategies contribute to their English language learning to find better ways to teach and learn English.

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A Discourse Analysis:
Listening Sections of Korean College Scholastic Ability Tests

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Abstract

I conducted a critical discourse analysis of the English listening sections of the 2019 and 2018 Korean College Scholastic Ability Tests (hereafter CSAT), which are national college entrance examinations in Korea for the year of 2019 and 2018. My goal is to investigate whether the dialogues in the English listening tests are appropriate for sociocultural interactions, which is important in language learning, and whether they are presented in meaningful communicative contexts to help the students to understand and develop interpersonal communication skills. I examined three dimensions of communicative events between speaker and hearer: 1) discourse structures, 2) discursive practices 3) social practices. The Korean Ministry of Education has made tremendous efforts for the revision of the English language education policy and teaching methodology to enhance Korean students' English communicative competence. To help to achieve the goal of enhancing the students' communicative competence it is important to develop good English tests. For this purpose, it is necessary to analyze the English listening sections of the CSAT and assess their validity. I hope my research will be helpful for both English teachers and examiners in making improvements to the English listening tests.

Keywords: Korean College Scholastic Ability Tests, natural discourses, English listening tests, interpersonal communication, discursive practices

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Introduction

Since English communication ability is considered essential as a tool for international interactions in the global community, English has become the most important among the foreign languages in South Korea (hereafter Korea). The Korean Ministry of Education has formulated English language education policies to develop Korean students' English language communication ability, trying to meet global standards. English education policies in Korea have changed many ways in various aspects. One of the changes was the implementation of an English listening test as a part of the Korean College Scholastic Ability Tests (hereafter CSAT) from 1994 to assess the test takers' English listening comprehension abilities (Jung, 2008).

This study aims to find out if the English listening sections of the 2018 and 2019 Korean CSAT, which is the national college entrance examination in Korea, are properly designed with meaningful real-life communicative contexts appropriate for developing or improving Korean students' interpersonal English communication skills. For this purpose, this research analyzes the discourses in the English listening tests in the framework of a sociolinguistic approach (Cameron, 2001, 2002; Gumperz, 1982, 2001), checking whether they are appropriate for sociocultural interactions, which are important in language learning. This study addresses the following research questions: 1) How natural are the discourses in the English listening tests? 2) Do the discourses in the tests reflect today's social issues? If so, how? 3) How are students portrayed in the discourses? Do they play a role as a main participant in the discourses? 4) How are word choices and language use in the tests?

Research Background

The traditional English teaching method in Korean schools before the introduction of the 7th National Curriculum in 1997 had been grammar-oriented and teacher-centered with a focus on form (Ellis, 2016). Students learned English by memorizing words and rules just focusing on grammar and translation without any meaningful communicative activities. *Korea Herald* (December 28, 2014) reported that "The Education Ministry recently announced the implementation of a new grading system for the English section of the college entrance exam, marking the first major change in the government's bid to reform Korea's problem-laden test".

Due to the divergent problems of the present CSAT such as educational capitalism and overheated competition for higher education, the Korean government changed the evaluation system for the English test of the College Entrance Examinations from norm-referenced evaluation to criterion-referenced evaluation to not only reduce the households' expenditure for private education but also decrease students' competition in the CSAT. The norm-referenced evaluation, for which test takers are classified into nine tiers, has problems since the criterion for the evaluation of the test results is not their achievement but their number. For instance, even if test takers have received a score of 97 out of 100 points, they may fall into a lower tier below the top tier if many students have obtained a higher score than they.

Literature Review

Krashen (1981) argued that comprehensible input is essential for assisting second language acquisition since "It requires meaningful interaction in the target language--natural communication--in which speakers are concerned not with the form of their utterances but with the messages they are conveying and understanding" (p. 1). Listening is an essential part of interpersonal communication (Place, 2019). Assessing listening comprehension is important to evaluate English language learners' communicative competence (Buck, 2001). Studies on English standardized tests including listening tests show that Korean students and educators have been faced with such issues as Korean students' pressure of English tests (Choi, 2008) and the troubles that the teachers and the students experience preparing for the tests because of huge disparity between the English test of the CSAT and the content of English education at school (Jeon, 2010).

To investigate the appropriateness of the discourses in the English listening tests, critical discourse analysis will be employed as an analytical tool in this paper. Fairclough (1995) stated that in critical discourse analysis (hereafter CDA) there are interactions among "three separate forms of analysis onto one another: analysis of (spoken or written) language texts, analysis of discourse practice (processes of text production, distribution and consumption) and analysis of discursive events as instances of sociocultural practice" (p. 2). Thus, critical discourse analysis is useful for examining language uses within social contexts in daily communicative situations. CDA includes various approaches intended for the social analysis of discourse focusing on the change of power within certain social practices (Fairclough, 1995, 2010; Fairclough & Wodak 1997).

CDA is a critical discourse analysis methodology for looking into the complexity of discursive practices across texts. It can be extended to intertextuality since texts are a form of discourse as well. (Fairclough, 1992). For example, conversations in textbooks or tests are multimodal texts since they include different modes with words combined with images (Gee, 2011). Van Dijk (2012) stated that speakers convey various implications to the recipients since "Discourses are like icebergs. Only a minor part of their meaning is 'visible' as explicit propositions expressed in their sentences" (p. 596).

Method

In 1994, the Korean government decided to include an English listening section in the college entrance English test implemented once a year. The English listening section in the Korean CSAT is a multiple-choice test composed of 17 questions about conversations designed to assess Korean EFL students' communicative ability to understand spoken discourses with a range of different topics. Five choices are given for each question about a dialogue or monologue and the test takers should select a correct answer. The Korea Institute for Curriculum and Evaluation (KICE) uploads the test with the answers every year after it is finished. I retrieved CSAT listening test papers, audio files and key answers from the KICE on-line database, and conducted a critical discourse analysis of the 2019 and 2018 CSAT English listening sections. CDA, which is an analytical tool, is an interdisciplinary approach to the analysis of the relations between discourse and social practices (Fairclough, 1995, 2003, 2010;

Van Dijk, 2012). By analyzing the KICE data of the audio files, answering sheets, and examination papers, I examined three dimensions of communicative events between speaker and hearer in the two English listening tests: 1) texts analysis (e.g. word choices), 2) discursive practices, 3) social practices (e.g. social relations, social events, contexts of communication).

Findings of Problems with Test Questions

1) Advertisement Discourse

In the contexts of social events, listeners can understand whether they are excluded from or included in the interaction, based on the speaker's choice of a personal pronoun like "she" or "you" (Fairclough, 2003). The choice of a pronoun in discourse can show social (e.g. we, they) relations or gender identities (e.g. he, she). Personal pronouns are markers of the roles of participants in discourse as social actors. For instance, the pronoun "I" (Jennifer Lee, who is the host of a radio program) indicates a speaker and "you", listeners, as exemplified below.

Table 1 *Text for Question 3 in the English listening test of CSAT 2018*

W: Hello, NPBC radio station listeners! **I**'m Jennifer Lee, the host of Monday Live. More than 100,000 listeners have installed and used **our** radio app on their smart phones to listen to **our programs**. To satisfy **our** audience's growing needs, **we**'ve added three new functions to **our** app. The best function is that **you** can download **your** favorite programs. This is useful if **you** miss our show or want to listen to it again. Another useful function is that **you** can bookmark
your favorite stories and listen to a personalized playlist. Finally, **you** can set an alarm to wake up to **your** favorite radio program. **I** hope these new functions of **our** radio app will make **your** day more enjoyable.

The above spoken text is a kind of advertisement about a radio program. The host of the radio program is telling the listeners to download the radio app on their smartphones to convey interpersonal information about her show. She is speaking to the listeners in order to persuade them to download the radio app with self-promotional elements in her words. Her words "more than 100,000 listeners have installed and used our radio app." can be interpreted as explaining that her show is a popular program. There is a grammatical element in her words which serves the function of emphasizing her intention. It is a present perfective aspect, which is expressed with the auxiliary "have" and a past participle such as "installed", "added". The use of the present perfective aspect has the effect of highlighting the information that her show is so popular that many people have downloaded it, serving the function of explaining why they should download it too.

Even though the text for "Question 3" is of the monologue form and the host of the radio program and the listeners do not communicate face to face, they are the participants in the communication, which is indicated by the host's use of the first and second person pronouns. The discourses we are engaged in with other people indicate many things. For example, the use of a personal pronoun can show whether the person referred to by the pronoun is included in or excluded from our conversation.

First and second person pronouns like "I" and "you" are used more often than 3rd person pronouns like "they" or "she". The test takers are hearers in the listening tests, so "you" are the pronoun for the test takers. In the context of conversation, personal pronouns such as "you" and "I" have a group meaning like "we". Therefore, when the test takers hear the pronouns "you" and "I" in listening tests, they could conceive of themselves as conversation participants since with "the pronouns 'I' and specific 'you', reference is to groups rather than individuals" (Fairclough, 2003, p. 149). 1st and 2nd person pronouns are used four times more than 3rd person pronouns. The radio show host, Jennifer used adjectives such as "best", "useful", "new", "favorite" as well as the second person pronoun "you", while talking to the listeners about her program and the radio app. Those expressions imply that it will be good for the listeners to use the app, which has excellent functions useful for them.

2) Tricky Items

In the 2018 CSAT, question 7 is about office workers' conversation concerning preparation for a workshop such as booking accommodations and ordering company T-shirts.

Table 2 *2018 CSAT Item 7*

W: Charlie, our department workshop in Jeju is only two weeks away.
M: That's right. Let's check if everything is prepared.
W: Okay. I've already booked the flight for everyone. Did you take care of the accommodations?
M: I did. I called several possible hotels and made a reservation at the one that gave us the best group price.
W: Excellent. Then what else do we need to do?
M: We need to figure out where to eat and also order the T-shirts with the company logo.
W: I heard there're many good places to eat in Jeju. I'll find restaurants online.
M: Sounds good. Then I'll order the T-shirts.
W: You have everybody's sizes, right?
M: Of course. I got them the other day.
W: That's perfect.

In this conversation, two office workers are sharing interpersonal information about what should be done for their workshop by using such expressions as "booked the flight", "made a reservation", "where to eat", "order the T-shirts". Their utterances, composed of direct speech acts, imply that they are colleagues in similar job positions at work since they used such expressions as "let's" instead of an honorific expression (polite forms of speech) like "sir" or a job tittle while checking on preparation for their department workshop in Jeju.

With the above discourse practice constructed in the context of the two office workers' workshop preparation, its surface meaning could be interpreted as they are collaborating, sharing information. Notwithstanding, such expressions as "best" "perfect" or "excellent" are intermingled in their words (e.g., "the one that gave us the best group price", "That's perfect"). Thus, it can be inferred from such expressions

that the two office workers intend to try to work as best as they can in preparation for their department workshop to make it a success.

The directions for test item 7 are "Listen to the conversation, and choose the most appropriate work the man is supposed to do. The five choices are: 1) To cancel an airline ticket, 2) To request permission for a business trip, 3) To design the logo, 4) To make a hotel reservation, 5) To order T-shirts, and the correct answer is number 5. It is one of the tricky test items that has nothing to do with assessment of the test takers' English communicative ability. For if they miss only one sentence "Then I'll order the T-shirts", which is not a key sentence expressing the main idea, it will be difficult for them to select the right answer even if they understand the whole discourse situation and the overall meaning of the dialogue.

3) Gender Bias

Fairclough (1995) argued that discourse practices may reflect prejudice and gender bias like male dominance in relationships between discourse participants such that a man's role is a boss and a woman's role is an employee. Gender bias is found in the following dialogues of the CSAT 2018 and 2019 listening tests:

Table 3 *2018 CSAT*

Q 4)
M: Honey, I heard the Smith family moved out to the countryside. I really envy them.
W: Really? Why is that?
M: I think we can stay healthy if we live in the country.
W: Hmm, can you be more specific?
Q 6)
M: Honey, Aunt Sophie just called me and said we can stay at her house next weekend.
W: Wonderful. I really like the family room there.
Q 10)
M: Honey, I'm looking at the Natural History Museum's website. The museum's going to hold
the Winter Discovery Camp.
W: What's it about?

Table 4 *2019 CSAT*

Q 9)
W: Good afternoon. What can I help you with, sir?
M: I'm looking for inline skates for my twins.
Q 10)
M: Honey, what are you looking at?
W: I'm looking at the International Fireworks Festival website. You know I love fireworks.

Through these dialogue, M is a man and W is a woman speaker. Two of them are interlocutors in the conversations. They are engaged in person-to-person conversations, exchanging opinions, which are associated with a speech function of "knowledge exchanges with Statements and Questions, activity exchanges with

Offers and Demands" (Fairclough, 2003, p. 224). A man calls a woman "Honey" in such a way that it can be inferred that they have a close relationship like a married couple. Men are leading the conversations, giving information (e.g. about the Smith family or what Aunt Sophie said) to women while women are requesting more information (e.g. Hmm, can you be more specific? or What's it about?) or giving a feedback token like "Wonderful". In 4 out of 17 items in the listening test of the 2018 CSAT, about 24% of men's roles are described as active information providers while women's roles are passive respondents.

Occasionally, utterances, texts, or semiotic resources such as gestures represent a power relationship, ideology or gender bias. Thus, communication between discourse participants could show their power relationship through conversational dominance, the number of words uttered or turn-taking (Coates, 2013). Lazar (2005) argued, from the feminist critical discourse analysis, that "the complex workings of power and ideology in discourse is sustaining (hierarchically) gendered social arrangements" (p. 141). Revealing gender differences in discourse is not a problem. However, it is problematic for the English listening tests to include discourses with gender bias, which represents "the unjust or biased treatment of people based on differences (e.g. religion, race, sex, nationality/citizenship status and stereotyping)" (Waugh et al., 2016, p. 72).

Like daily conversations, discourses in the listening tests are composed of utterances. As we communicate, reflecting the sociocultural aspects of our present society through our language, so also the discourses in the listening tests can reflect society. Therefore, the discourses in the tests, which are produced with the test developers' intentions, may have an indirect influence on the test takers, who are hearers, when they take English listening tests, listening to the speakers' words.

Authenticity

Discourse is comprised of communicative interactions we engage in for social life, which occur in our real-life situations. Waugh et al. (2016) stated that we play a role as a social actor in discourse, and by doing so we express ideas and emotions in various ways like we take pictures at different camera angles. Natural pragmatic use of language and discourse practices occur in the context of real life communicative situations, which include intuitional settings like school environment (Potter, 2012). In fact, L2 students develop knowledge of pragmatics by learning their target language through learning materials with natural discourse content (Cohen, 2018). Thus, it is important to teach L2 learners natural discourses which can be used in real communicative situations, since language has the structure and properties that serve communicative functions of transmitting and receiving information in natural contexts (Ellis & Beattie, 2017).

Nevertheless, the 2018 and 2019 Korean scholastic ability tests include unnatural discourses in the English listening sections which lack naturalness and spontaneity of speech. In the 2018 CSAT, question 7 is about office workers' conversation concerning preparation for a workshop such as booking accommodations and ordering company T-shirts. Question 10 is about the communication of parents looking for a winter camp for their son, and Question 15 is about two teachers' working for an after-school program. Similarly, 2019 CSAT items 2 and 9 are about

communication between a father and a saleswoman for their children. Item 10 and item13 are about a married couple's conversation. Discourse participants are office workers, couples, parents, and teachers rather than students. Inevitably, discourse situations like a department workshop, finding a son's winter camp or preparing a school program may sound unnatural to the test takers.

Naturalness and authenticity of English discourses, which can enhance hearers' understanding, is important to help the test takers to understand English language use. Because the CSAT English listening tests are made in a short time by external test developers selected by the KICE, the dialogues lack authenticity and naturalness since they are not real-life conversations but artificially created ones even if the test developers may have tried to make natural dialogues as best as they could.

Conclusion

Recognizing the importance of English as an international language, the Korean government has been endeavoring to develop Korean students' English communicative competence in various ways. Educators and parents also have tried to support English education for improving their English proficiency. More than twenty years have passed since the Korean government introduced the new English education policy (7th curriculum in 1997) for Korean students' English language learning. Adopting CDA as an analytical tool, this study has examined how the Korean CSAT English Listening Tests are implemented and whether or not they are properly designed with natural communicative contexts and real-life situations suitable for evaluating the test takers' English communicative competence.

The findings of this study are as follows. The English listening sections of the 2018 and 2019 Korean Scholastic Ability Tests have such problems as gender bias, lack of naturalness found in real interpersonal and intercultural communicative situations. In English learning, L2 learners (whose target language is English) need to learn what natural English discourses are like that can be used in real communicative situations. Waugh et al (2016) argued that from the pragmatic point of view, "authentic language use and actual language users in interaction are primary" (p. 90) in real social contexts with a focus on the whole speech.

Implications

Education policies are often formulated and implemented to solve educational problems. Educational policies can make a great impact not only on education fields but on the society as a whole. The Korean government and the Ministry of Education have made great efforts to make and implement good education policies to improve Korean students' English proficiency (Chung and Choi, 2016). The Korean Ministry of Education decided to change the English test evaluation method from norm-referenced evaluation to criterion-referenced evaluation, beginning from the 2018 CSAT.

For L2 students to develop communicative competence, they need to learn genuine interactions through immersion in an L2 speech community (Cohen, 2018). Studies on development of L2 pragmatic competence suggest that discourses for L2 students need to contain intercultural resources that can mediate social meanings in speech acts

(McConachy, 2017; Wang & Halenko, 2019) and connect to real interaction situations through technology such as a computer or the internet (Cohen, 2018; Tang, 2019) to enhance English language learners' pragmatic abilities. Therefore, the discourses in the CSAT listening tests should include authentic English dialogues to check whether the students have an English ability to understand natural spoken English and communicate with others in their daily life. For this, the discourses in the listening tests should be designed in such a way as to match real-life communication situations with a variety of speech acts we encounter in our daily life. The result of this research will be a foundation for further research needed to address the issue of appropriateness and validity of the Korean CSAT English listening test and to develop a proper evaluation method for measuring Korean students' English listening and speaking abilities.

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Math Readiness: Early Identification of Preschool Children Least Ready to Benefit from Formal Math Instruction in School

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Abstract

The math skills and knowledge measured at or near the beginning of school entry are most predictive of later school success. Unfortunately, deficits in math understanding can begin before students enter school, often due to home environments that lack sufficient mathematics enrichment. Moreover, the gap between students who begin school behind their more prepared peers only widens as students move through successive grades. As a result, developing ways to quickly assess and address gaps in students' mathematics foundations at school entry is critical to ensure future success in math. The present study presents findings from an evaluation study involving an adaptive digital mathematics program designed to assess and teach number sense skills to 292 low-SES children in 20 preschool classrooms in Southern California. The program consists of a set of research-based personalized learning games designed to address foundational number sense skills. Analyses revealed that preschool children with low prerequisite knowledge at the start of the school year were unable to progress effectively in the program. Results of this study confirm the need for the development of interventions that address early mathematics readiness skills for students, and call for educational programs that can quickly identify children who may not be ready to take full advantage of school mathematics instruction and to address their needs before the onset of formal schooling.

Keywords: mathematics readiness, early childhood, adaptive instructional system

Introduction

The Importance of Early Childhood Mathematics

Research from the past couple decades has found that while math, reading, and executive functioning skills are important predictors for later school success, certain math skills and knowledge that is measured at or near the beginning of school entry, in particular, are most predictive of later school success (Duncan et al., 2007; Claessens & Engel, 2013; Nguyen et al., 2016). For example, Nguyen and colleagues (2016) followed a diverse sample of students from preschool through the end of 5th grade and found that several preschool mathematics competencies are predictive of overall fifth grade mathematics achievement, with counting and cardinality competencies being the strongest predictors. They also found that certain advanced counting and cardinality competencies were much more predictive of later achievement than basic counting and cardinality competencies (Nguyen et al., 2016). This echoed earlier work of Claessens and Engel (2013) that also showed that key early math competencies such as count all, count on, count forward and backward from any number (within 10) were most predictive of later success in math.

It is evident that the development of key mathematical competencies early on leads to success in mathematics as students move forward in their schooling. However, not all children are able to master these key competencies during the critical window of early childhood, in preschool, or in Kindergarten (Claessens & Engel, 2013; Jordan & Levine, 2009). More importantly, these disparities appear to widen as children move on through schooling (Duncan & Magnusen, 2011; Seigler, 2009). Children who start with strong math knowledge and skills tend to attain higher levels of mathematics achievement as they move through school, while children who begin gaps tend to fall further and further behind (Seigler, 2009).

Differences in Mathematics Knowledge at School Entry

Children begin school with a wide range of mathematics knowledge and skills. Experiences in the child's home environment prior to the onset of formal schooling can provide a strong foundation for learning mathematics (Blevins-Knabe, 2016; Lee & Ginsberg, 2009). Conversely, a lack of enriching environments or experiences can result in gaps in children's mathematics foundation, causing them to be less prepared to take advantage of formal math instruction in school. As an example, consider that it can take a child a year or more to move from producing a set of one to producing a set of four (Wynn, 1992). If the child has not had enough exposure to counting sets of objects prior to beginning school, it is possible that she may not be able to master counting out a set of ten objects, a common kindergarten learning objective, within one year of schooling.

Designing a Mastery-Based Early Mathematics Program

Because children enter school with such varying degrees of prior mathematical knowledge and ability, it is vital to develop curricular programs that quickly assess and adapt to individual student needs. Advancements in technology and artificial intelligence (AI) have made it possible to develop highly engaging programs capable of individualizing the curriculum in real time and at scale, based on the ongoing data

collection for each student, potentially closing the achievement gap and preparing students for success in mathematics.

This study explores a mastery-based early mathematics program called ABCmouse Mastering Math[TM], developed by Age of Learning, Inc. (see Figure 1 for examples). Mastering Math is a game-based adaptive learning system designed to help young children from preschool to 2nd grade build a strong understanding of fundamental number sense and operations. Mastering Math is available as an app for smartphones and tablets and in both English and Spanish.

The development of Mastering Math was based on years of research, user-testing, iteration, and proto-type development, designed by a team working in fields of learning sciences, educational research, curriculum, game design, art, engineering, and data science. Throughout its design and production, the team employs learning engineering, "a process and practice that applies the learning sciences, using human-centered engineering design methodologies, and data-informed decision-making to support learners and their development" (ISLS, 2019).

Theoretical foundations of learning sciences have been applied to inform Mastering Math's content, pedagogy, and design for learning and engagement (see also Owen, in press; Betts, 2019; Goodell & Thai, in press). The curriculum was built upon Benjamin Bloom's (1968) model of Mastery Learning and Simon's (1995) theory of Hypothetical Learning Trajectories. Similar to the beliefs of early learning theorists such as Piaget and Vygotsky, Bloom believed that learning occurred as a sequence of experiences, each building on the knowledge of prior experiences. In Bloom's Mastery Learning model, all skills and knowledge to be learned are organized by expert teachers into hierarchical learning "trajectories" that provide a pathway for students to master earlier skills before moving on to later skills (Bloom, 1968). Simon (1995) furthered this idea through the concept of hypothetical learning trajectories. Hypothetical Learning Trajectories (HLT) describe student pathways through a specific set of activities that lead to mastery of various learning objectives. While there is perhaps a single hypothetical learning trajectory that describes a typical learner's pathway through the universe of learning objectives that comprise a topic, there are an infinite number of learning trajectories that different students may take as they master the content. This is because the best or most efficient way through the content is likely to be different for each learner, and is based on many factors, including the student's prior knowledge, learning pace, the quality of the planned activities, as well as the teacher's expertise and knowledge.

The focus of this paper is on the curriculum coverage of Mastering Math. For theoretical foundations underlying of the design and development of other aspects of Mastering Math, see Owen (in press), Owen & Hughes (2019), and Betts (2019).
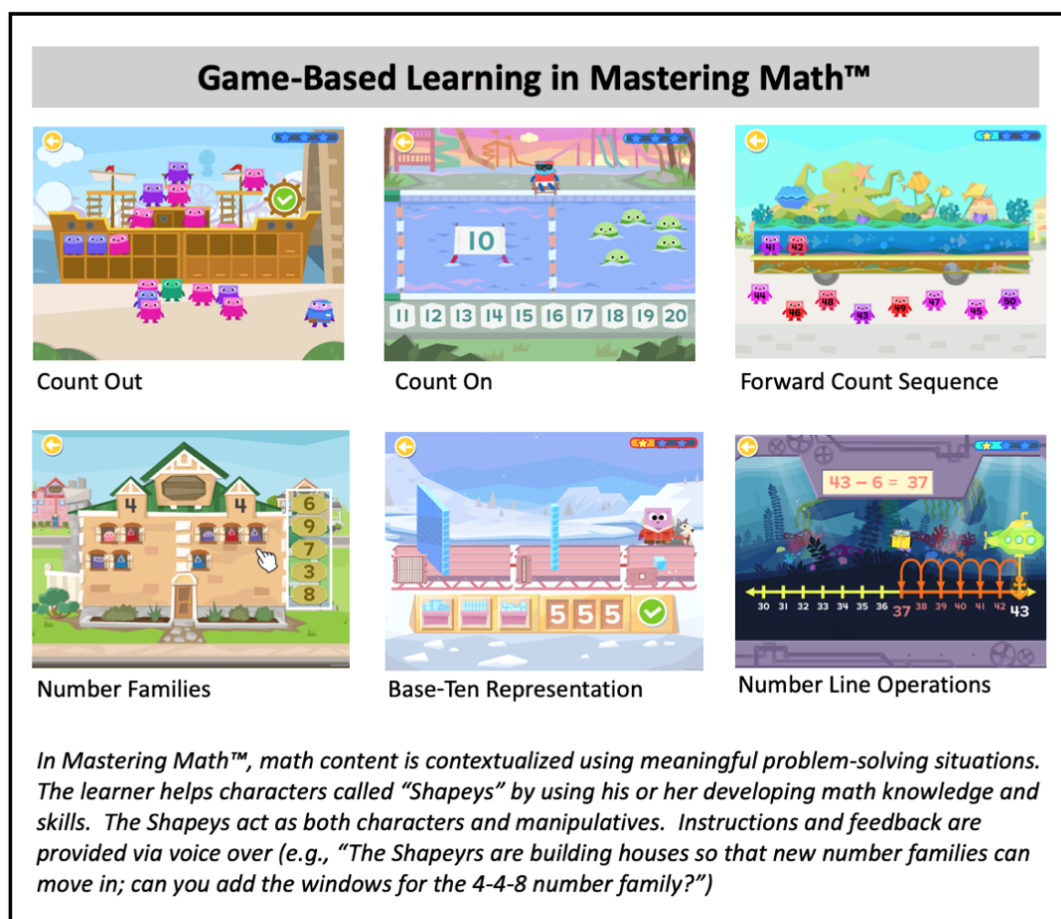
Figure 1: Sample screenshots and a brief description of Mastering Math games.

The primary goal of Mastering Math is to ensure that every learner masters key early mathematics competencies in order to progress forward without gaps. The underlying pedagogy is founded on the idea that all precursor learning objectives should be mastered before moving on to successor learning objectives (Bloom, 1968; Simon, 1995). As such, the Mastering Math development team created a hypothetical learning trajectory (Simon, 1995), detailed in an extensive knowledge map that defines the principles, concepts, skills, and data that a learner must master in the domain of early number sense (See Figure 2).

Mastering Math Knowledge Map

Strands. Different colors on the map represent different strands within early number sense, such as: numeral recognition, count sequences, counting objects, place value and base ten representations, operations, etc.

Learning Objectives. Each colored rectangle represents a single concept, principle, skill, or datum that a learner must understand, know, or be able to demonstrate in order to build his or her number sense foundation and progress.

Relationships. Each line connecting one rectangle to another represents a precursor, successor, or correlational relationship between concepts, principles, skills, and data. These relationships are used to create hypothetical learning trajectories through the collective content.

Figure 2. The Mastering Math knowledge map.

The knowledge map informs both the development of highly engaging math games, and AI algorithms that analyze the players' clicks, taps, drags, and more to evaluate whether the player has (1) mastered the objective, (2) needs additional help or scaffolding, (3) needs reteaching, or (4) should pursue a different objective altogether. As the learner plays the games in the system, the system uses the data being gathered to create hypothetical learning trajectories that are completely unique to each learner. These individualized learning trajectories adapt real-time to new information as it is gathered about each learner's performance. Figure 3 shows examples of four different learner trajectories though a portion of learning content (games) in the system.

Each individual game maps to a learning objective and is supported by an interactive instruction level, as well as several layers of scaffolding and feedback. In addition, the Mastering Math system uses cohesive narrative and interactive characters (embedded at the level of individual games) to support student engagement with the learning world. Within individual games and between games, built-in adaptivity provides scaffolding and adjusts difficulty. Across the system, this adaptivity gives learners a customized pathway between skills based on prior performance. Assessment is embedded throughout the play experience, including game-based pretests and final assessment tasks at a granular skill level. In sum, Mastering Math combines math curriculum with learning sciences, adaptive technology, and instructional design and production. With engaging characters and scenarios, individualized learning pathways, and continuous assessment built into every level of every game, Mastering Math aims to help students learn and make sense of math in an enjoyable and highly effective way.
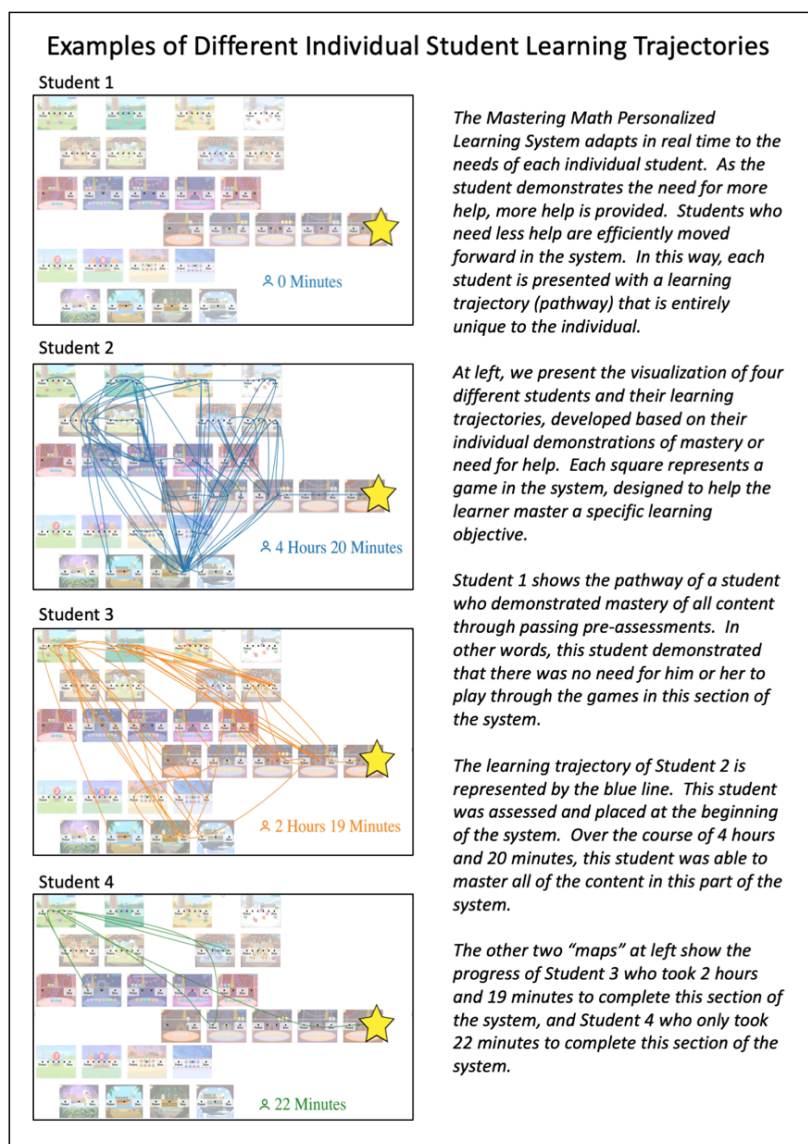
Figure 3: Sample individual student learning trajectories.

Mastering Math Efficacy Studies

Mastering Math efficacy studies provide insights into what is working about the system and to inform what can be improved. In setting out to address the foundational math competencies, it is important that we evaluate how well Mastering Math can address the needs of the targeted age groups in both prekindergarten and kindergarten. The goal of this paper is to illustrate the need for development of interventions that address math readiness skills.

The first iteration of Mastering Math, which included games that targeted the mastery of prekindergarten and kindergarten number sense learning objectives, was released in the spring of 2017. At that time, Mastering Math contained 29 games addressing granular skills within number recognition, forward and backward counting, and counting from 1 to 20. Each game included up to six learning activities at various difficulty levels, including a pretest and an in-game mastery check called the "boss" level. Students were able to demonstrate mastery by passing the pretest, passing the

boss level (after failing a pretest), or getting placed out of a skill by passing a more advanced skill. If students demonstrated mastery of all skills in the app, they received practice boss levels on high level skills.

During the fall of 2017, researchers and developers at Age of Learning partnered with independent researchers at WestEd to conduct two efficacy research studies. The first was conducted on Kindergarten students (Thai, Schachner, & Li, 2019), which is summarized briefly below, and the second on Pre-Kindergarten students, which is the focus of this paper.

The Kindergarten Study

This randomized controlled trial involving 453 students from 20 kindergarten (K) and transitional-kindergarten (TK) classrooms at 4 Title I elementary schools in urban South Central Los Angeles, California. Prior to the start of the study, half of the classrooms were randomly assigned to the treatment group to implement Mastering Math for 15 minutes per day, 3 days per week, for the fall semester. The control group did not receive Mastering Math access and conducted business-as-usual instruction. For the implementation period, each treatment classroom received six tablets with access restricted to Mastering Math for implementation in small groups. Control classrooms did not have tablet access. Before and after implementation, both groups were tested with selected items from the Test of Early Mathematics Ability, Third Edition (TEMA-3; Ginsburg & Baroody, 2003), a standardized and nationally normed reference assessment of mathematics performance of children ages 3 to 8 and 11 months.

These pretest and posttest scores were used in a three-level hierarchical linear model accounting for differences by students based on their pretest score, group assignment, and school. This enabled the comparison of the treatment group's posttest outcomes against the control group after adjusting for differences in baseline scores. Results showed that the treatment group outperformed the control group by 5.71 percentage point at posttest (Treatment M = 62.15, SD = 24.61, Control M = 56.44, SD = 25.06), and this difference was statistically significant after controlling for differences in pretest (p = .03, effect size = .23). The difference between the two groups at pretest was not statistically significant (Treatment M = 43.56, SD = 25.21; Control M = 40.07, SD = 24.80; p = .33, effect size = .14). Mastering Math produced 36% greater gains in treatment children's mathematics knowledge and skills than control children. Treatment students on averaged spent 5.22 hours (SD = 2.97 hours) on Mastering Math, an average of 28-35 minutes per week over the course of 12-14 weeks. They completed on average 79 learning activities (SD = 40.93), started 11.5 games (SD = 6.12) and acquired mastery on 2.21 skills (SD = 5.10) that they have not demonstrated mastery for during in-game pretests. The more students used Mastering Math and completing more games, the greater their learning gains (r = .19, p < .01, and for those completed at least one boss level, r = .38, p < . 01).

These results are encouraging, suggesting that a research-based, developmentally appropriate, individually appropriate, culturally and linguistically appropriate game-based curriculum can meet individual students' math learning needs. This result is particularly notable because the treatment teachers were not provided with

comprehensive training on Mastering Math prior to the study nor were they informed of their students' in-app performance during the study.

Additional analyses from this study revealed an interesting impact of Mastering Math based on pretest score, as measured by the TEMA-3. The greatest learning gains from Mastering Math were most notable in children who scored in the middle third at pretest (Figure 4, n = 150, point of estimate = 7.28, p = .04, effect size = 0.46). Students who scored greater than in the top third at pretest also showed statistically significantly greater gains than similarly scoring peers from the control group (n = 149, point of estimate = 5.87, p = .01, effect size = .37). This suggests that the impact of Mastering Math were greatest for those with some prior, basic number sense. This result begins pointing to the need for developing supports for children with the lowest level of prior math knowledge as well as instructional materials and tools that enable teachers to effectively intervene in helping these children learn.
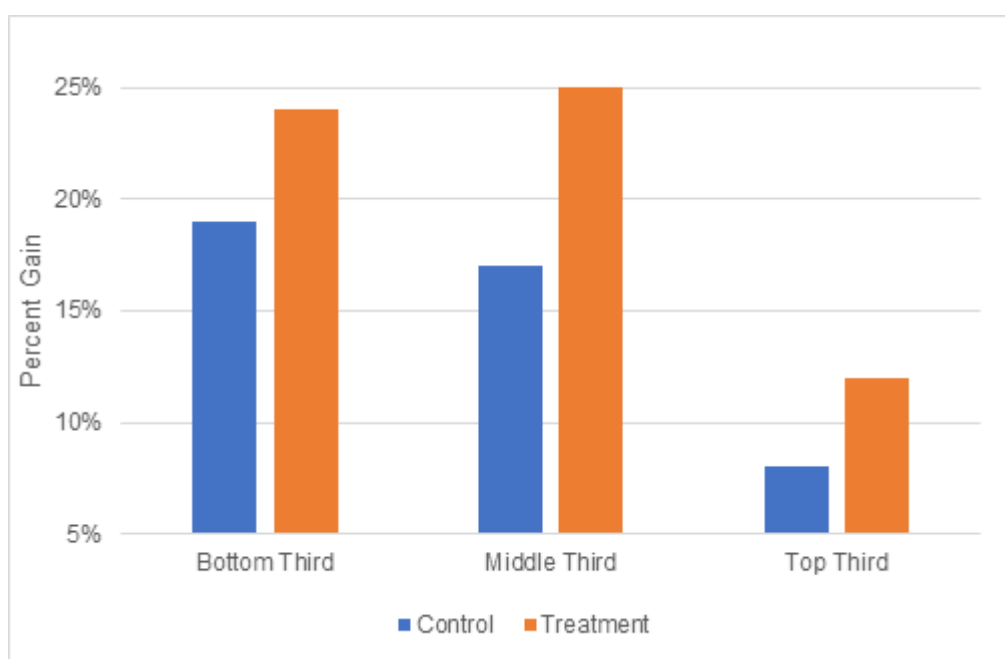
Figure 4: Percent gain in TEMA-3 math scores based on prior knowledge for treatment and control group students based on the approximate top, middle, and bottom thirds at pretest (p < .04, effect size = 0.46). Cutoffs were as follows: top third TEMA-3 score > 50% correct (control n = 67, treatment n = 82); middle third ≤ 50% correct and > 23% correct (control n = 70, treatment n = 80); bottom third ≤ 23% correct (control n = 58, treatment n = 71). (From K study, Thai, Li & Schachner, 2019, with permissions)

The Pre-Kindergarten Study

To confirm that hypothesis and to further evaluate the impact of Mastering Math, this study examined the efficacy of Mastering Math on a younger age group with Pre-K students.

Methods

Treatment and Control Conditions

Similar to the K study, this study used a clustered randomized controlled design. 20 Pre-K classrooms were randomly assigned to either a treatment group or a control group. The study took place over thirteen weeks in the Fall semester of 2017. The treatment group had access to Mastering Math (the same version used in the K study) via individual iPads, and were asked to use it for 15 minutes per day, three days per week, during the eight- to ten-week study period. Treatment teachers were provided with some minimal training into using Mastering Math with students, but they were not provided with strict implementation guidelines around how or when to implement the app in their classroom, other than to aim for 15 minutes of usage for three days per week.

The control group used business-as-usual mathematics instruction and materials.

Instruments

The following measures were collected from both the intervention and comparison groups before the intervention began. They were used to test the baseline equivalence between the intervention and comparison groups and/or served as covariates in the impact analyses.

Test of Early Mathematics Ability (TEMA-3)

The Test of Early Mathematics Ability, third edition, is a primary test of children's informal and formal mathematics knowledge, developed by Western Psychological Services. It is a standardized, nationally normed achievement test (Ginsburg & Baroody, 2003). The test is designed for use with children ages 3 years, 0 months through 8 years, 11 months. It measures four categories of informal mathematics: Numbering, Number Comparisons, Calculation, and Concepts. It also measures four categories of formal mathematics: Numeral Literacy, Number Facts, Calculation, and Basic 10 Concepts. Table 1 provides a description of each category of informal and formal mathematics. The test contains 72 items (each item may have multiple problems) in two forms. The TEMA-3 is not a timed test, and no precise time limits are required for children being tested. Depending on children's mathematics ability, children will be able to complete all 72 items or the relevant portion of the test. On average, it takes 45-60 minutes to administer.

The test examiner's manual reports an alpha of 0.94 for Form A and an alpha of 0.96 for Form B (Ginsburg & Baroody, 2003, p.32). The manual also discusses test content-description validity, criterion-prediction validity, and construct-identification validity. The test has been matched for content coverage and difficulty.

For the purposes of this study, 20 TEMA-3 items that best represented the types of numeracy skills found within Mastering Math were selected for use as a modified assessment. All students were administered all 20 selected TEMA-3 items. The experimental score of the selected items was used to analyze children's mathematics ability. The experimental score is simply the number of trials scored correct on the

selected TEMA-3 items (one point per correct response). Each TEMA-3 item may have multiple trials. The total number of trials within the selected TEMA-3 assessment is 43. Since participating students were in pre-kindergarten, we especially focused on 10 items (24 trials) that address preschool math skills. The scores represented the percent of trials that were answered correctly, which were calculated by summing the number of trials answered correctly divided by the total number of trials in the assessment. Therefore, the scores range from 0 to 100%. The selected TEMA-3 Form A was used as a pre/post measure for children. The pre-test was administered to students prior to classrooms assignment to the treatment or control condition in August and September of 2017; the post-test was administered in November and early December of 2017 at the conclusion of the study. Of the 10 treatment classrooms, 30% were tested after eight weeks of intervention, 40% were tested after nine weeks of intervention, and 30% were tested after 10 weeks of intervention.

Table 1. Description of Categories of Mathematics in TEMA-3

Categories of Mathematics	Description of the Categories
Informal Mathematics	
Numbering	Pre-counting numbering abilities: e.g., children learn to recognize collections of one or two items and label them "one" and "two".
Number Comparisons	Comparing two or more collections: e.g., children learn the term more and use it to label the larger of two collections that obviously differ in number.
Calculation	Mentally and nonverbally adding two small, previously viewed collections; solving word problems with sums up to 12 by counting or reasoning: e.g., after seeing one item covered and a second item slipped under the cover, children can determine the sum and indicate their answer by producing two items.
Concepts	Determining key aspects of understanding that underlie number and calculation skills at the counting phase: e.g., children learn that a whole is the sum of its parts and that the whole is larger than any single part.
Formal Mathematics	
Numeral Literacy	A major transition in children's ability to represent numbers involves the ability to read, write, and understand numerals: e.g., children learn that the numeral 2 is read aloud as "two" and conversely that the spoken word "two" is written as 2.
Number Facts	Mastery of the basic number combinations and ability to quickly generate the answer to single-digit addition, subtraction, and multiplication facts: e.g., children have learned that $2+0=2$ and $3+0=3$, they may extract a principle to the effect that adding zero to any number does not change it.
Calculation	Addition and subtraction accuracy: e.g., children can talk aloud as a problem is being solved and can justify their procedure.
Basic 10 Concepts	Grouping by 10: e.g., children understand that when one carries, one is really regrouping by units of 10s, 100s, and so on.

In-Game Usage Logs. The Mastering Math app was configured to track user activities and log when participants accessed the app, which games within the app were played, approximately how long participants used the app, and participants' progress on each game.

Sample Characteristics. A total of 20 Pre-K classrooms were recruited through one public school district in Southern California, resulting in 141 children in the treatment condition and 142 in the control condition (total n = 283 students, 55% female). Students in this school district were 85% Hispanic, 9% African American, 6% Caucasian, 2% Asian, and 2% Other. 82% of students in this school district received free lunch, and 27% were English Language Learners. The final analytic sample for student mathematics skills and knowledge achievement included a total of 272 students from 20 classrooms with both non-missing pre and post assessment data. Table 2 presents the individual characteristics of participants by treatment condition. The treatment and control groups did not differ significantly in attrition and age. The control group had more students whose preferred language was Spanish. In addition, the treatment and control groups were equivalent at baseline as measured by the selected TEMA-3 items (see Table 3).

Table 2. Participant Demographic Information, by Experimental Condition

	Treatment		Control		p-value
	Number	**Percent**	**Number**	**Percent**	
Attrition					0.14
In analytic sample	133	94.33%	139	97.89%	--
Attrition	8	5.67%	3	2.11%	--
Preferred Language					0.05*
English	118	88.72%	107	76.98%	--
Spanish	11	8.27%	25	17.99%	--
English/Spanish	4	3.01%	7	5.04%	

	Treatment	Control	Difference	Effect Size	p-value
Age					0.74
Mean	4.47	4.46	0.01	0.04	
Standard deviation	0.25	0.25	--		--
N	131	139	--		--

* Significantly different from zero at the .05 level, two-tailed test.

Table 3. Key Measures at Baseline, by Experimental Condition

Measure	Treatment	Control	Difference	p-value
Overall Experimental Score of Selected TEMA Items				
Mean	0.32	0.31	0.01	0.95
Standard deviation	0.16	0.16	--	--
N	133	139	--	--
Experimental Score on Preschool Math Skills				
Mean	0.40	0.40	0.001	0.99
Standard deviation	0.24	0.23	--	--
N	133	139	--	--

Data Analysis Methods

Assignment to the treatment or control groups occurred at the classroom level, creating a "cluster" intervention design. Given this design, a hierarchical linear model was used to investigate the impact of the Mastering Math app on student mathematics knowledge and skills (postMATH), structuring students nested within classrooms. This model is preferred to more precisely estimate the impact of the intervention when within-group and between-group effects need to be accounted for (Raudenbush, 1997). To control for student performance at baseline, we included students' pretest scores on mathematics knowledge and skills (preMATH) and preferred language as covariates in the Level 1 model. The Level 2 model included the intervention variable (TREAT). The main effect model was specified using the covariates listed above, and run using Stata 14 statistical analysis software. The models were specified as follows.

$$\text{Level 1: postMATH}_{ij} = \pi 0_j + \pi_{1j}(\text{preMATH})_{ij} + \pi_{2j}(\text{Preferred Language})_{ij} + e_{ij}$$

$$\text{Level 2: } \pi_0 = \beta_{00} + \beta_{01}(\text{TREAT})_j + r_{0j}$$

This model allowed researchers to compare the treatment group's post-intervention outcomes with those of the control group, after adjusting for difference in baseline scores.

Several approaches were utilized to address missing data. Students who did not take both the pre- and post-assessments were excluded from the analytic sample for the outcome measure. For the outcome measure, missing item responses were treated as incorrect responses. Participants who missed all the items in the outcome measures were removed from the corresponding analyses.

Results & Discussion

Throughout the intervention, students on average actively engaged in Mastering Math games for 343 minutes. They demonstrated mastery on 7 skills, and 5% of students were able to master all of the skills available in Mastering Math at the time. Most of the students were able to play games focusing on skills such as count all, count forward, count out, and number recognition. However, the majority of the students did not have exposure to games that teach count backward, count on, and mental

number line.

Overall Impact on Children's Knowledge and Skills in Mathematics

The results indicate that the Mastering Math app intervention was positively associated with gains in children's knowledge and skills in mathematics, as measured by the selected TEMA-3 items (see Table 4). Adjusted mean differences on the post-test measure of the selected TEMA-3 items show that the treatment group exceeded the control group (point estimate of 2%; effect size = 0.13); however this difference was not significant at the .05 level after accounting for differences in baseline children's mathematics development and participant preferred language. A similar positive trend was found on the post-test measures of the selected TEMA-3 items on preschool math skills.

Table 4. Impact Analysis of Student Outcome Measures

	Adjusted Mean					
Impact Measure	Treatment (Standard Deviation)	Control (Standard Deviation)	Difference (Standard Error)	p-value	95% Confidence Interval	Effect Size
Overall Experimental Score of Selected TEMA-3 Items	0.43 (0.19)	0.41 (0.17)	0.02 (0.02)	0.20	-0.01 – 0.05	0.13
Experimental Score on Preschool Math Skill	0.55 (0.26)	0.53 (0.24)	0.02 (0.02)	0.22	-0.02 – 0.07	0.08

Effect size was calculated by dividing impact estimate by the control group unadjusted standard deviation of the outcome variable

Impact by Prior Knowledge

Students with the highest quartile of TEMA-3 pretest score (High prior knowledge) had the greatest and statistically significant gains from Mastering Math ($t(77) = 2.40$, $p = .02$, effect size = .54) compared to the control group (see Figure 5). Students with the lowest quartile of TEMA-3 pretest score (Low prior knowledge) did not show any difference in gains ($p > .10$). Those in the middle 50% at pretest showed an advantage toward Mastering Math, but the effects were not statistically significant (p's > .07). This suggests that students needed to have a certain prior knowledge requirement in order to benefit from Mastering Math.
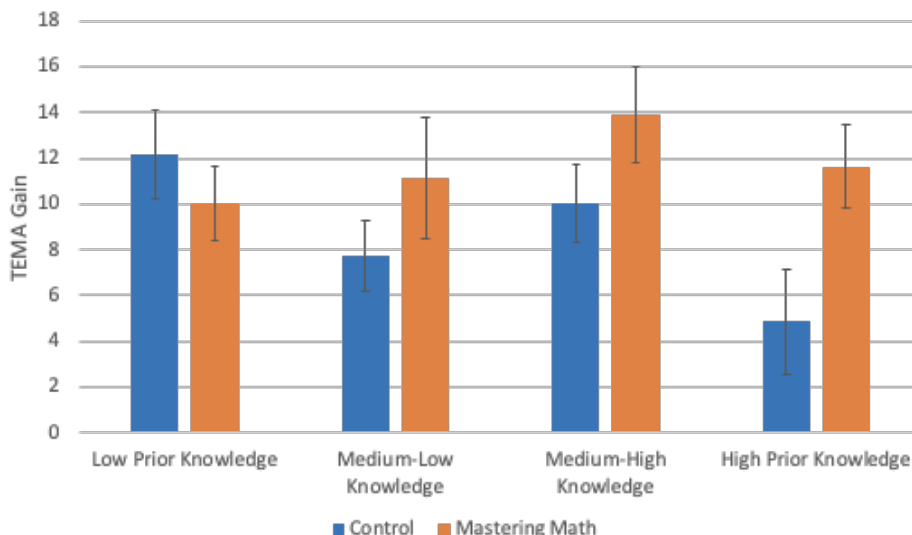
Figure 5: PreK learning gain by prior knowledge quartiles

Interestingly, when relating to performance within Mastering Math, Treatment children with Low prior knowledge were indeed those who were most often "stuck" in the games (see Figure 6). "Stuck" is defined as not having progressed after 5 activities in the same level within any game (Owen et al., 2019). While over 25% of students were identified as Productive in the Low prior knowledge group, an overwhelming 62% were stuck in the games. And this percentage of Low prior knowledge students identified as "stuck" in the games were drastically greater than those with higher prior knowledge, which averaged around 10% of students. Prior research has shown that in-game performance is directly correlated with actual learning outcomes, as measured by external assessments (Thai, Li, & Schachner, 2019; Jacobs et al., 2019; Owen et al., 2019). This confirms that finding of the alignment between game play and learning outcomes, but more importantly, suggests that game play experience can be improved to address the needs of children with low or no relevant prior knowledge. In the following section, we consider several hypotheses and evaluated the available data to derive insights into what improvements need to be made.
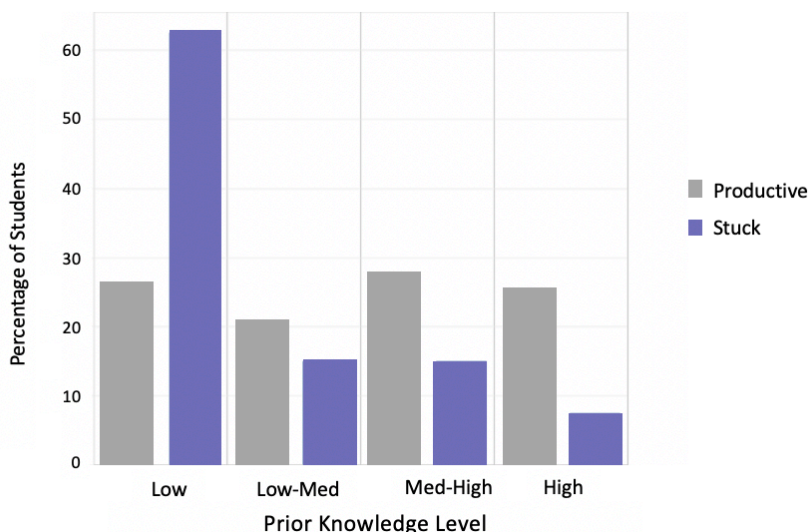
Figure 6: Percentage of PreK student experiencing stuck and productive states in Mastering Math by prior knowledge level.

Why might Low prior knowledge students get stuck in Mastering Math?

There are a number of possible reasons as to why students may be stuck in the first place. One likely reason is the lack of prerequisite knowledge for the games, but what kind of prerequisite knowledge? When we look at the TEMA-3 pretest performance of Low prior knowledge students, 70% of low prior knowledge students could not count to five on fingers, 93% couldn't identify numbers 1 –5, and 98% couldn't produce finger displays to 5. These basic counting forward and number identification skills are the basic building blocks to higher number sense skills, as they are also reflected on our knowledge map. Children who have difficulty with these tasks likely do not know the number words from one to five, can recognize that the symbols for numbers (i.e., 1) go with the sounds (i.e., "one"), and/or know to point to each of the objects (or fingers) once and only once as each number word is said. Accuracy in finger displays is useful for finger counting, a technique that many young children employ (Andres, Di Luca, & Pesenti, 2008).

Correspondingly, a large percentage of Low prior knowledge students could not complete the games that address the most foundational skills on the knowledge map. 55% of Low prior knowledge students were stuck on a game involving counting forward on a tightrope, compared to 0% of High prior knowledge students. In this game, students were asked to place the appropriate Shapeys marked with numbers 1 to 5 onto the tightrope in the correct order (see Figure 7). Low prior knowledge students who could not demonstrate mastery on either game (by placing numbers 1 to 5 in the correct order) were not able to progress deeper in the knowledge map.

Similarly, 37% of Low prior knowledge students did not demonstrate mastery on another foundational game that reinforces the identification of numbers 1 to 5 (i.e. Tagging Game 1-5, see Figure 8), compared to only 8% of higher prior knowledge students. In this game, students were presented with a moving array of numbers from 1 to 5, and were asked to identify all instances of a given number. While not all students who performed poorly on number identification on the pretest were stuck in the Tightrope or Tagging game, the relatively large percentages of Low students were, suggesting that these games may not be enough to introduce students to number naming. This suggests that prerequisite content aimed to introduce number naming of numbers may be necessary in Mastering Math for those children very little to no prior knowledge.

Figure 7: Screenshot of Tightrope game.
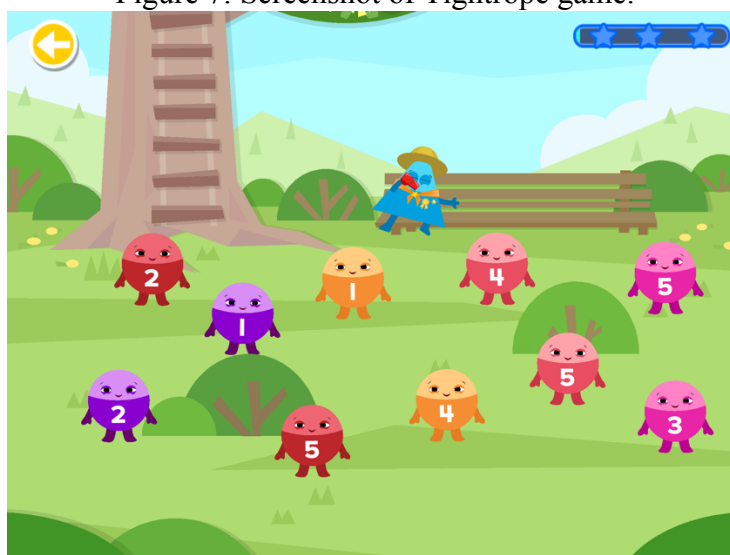
Figure 8: Screenshot of Tagging game.

This result also calls for a re-examination of the design of educational technology to appropriately measure and teach foundational skills with very young children. Consider the skill of reading or naming numerals, for example. The first 10 written numerals in the English language (from 0 to 9) are completely arbitrary and must be learned through rote memory. To assess a child's ability of reading numerals, a typical assessment involves presenting her a number "4" and ask her to respond verbally "What number is this?". Typical instructional activities should similarly include many opportunities for her to hear the sound "four" with the written numeral 4, and to practice saying the sound upon seeing the number. When it comes to translating these tasks to educational technology, particularly a game-based one, there are major technological and design constraints (e.g., such as the lack of effective speech recognition for children).

Despite major advances in technology in the past few decades, at the time of this research, reliable speech recognition technology for young children to use independently is not available. This meant that we could not ask the child to speak "four" to assess whether they know what number is 4. We also needed to rely more on

visual representations to drive children's interactions. For example, in the Tagging game, rather than asking students to say aloud the name of the number, we asked them to tap on all instances of the number given its sound. We found this design compromise acceptable, as number recognition (vs. number naming) is an important prerequisite to later games and could provide reinforcement opportunities for children throughout all games in the system.

Our results suggest however, that children require more opportunities and experience with numbers than our games could provide. For example, recall that it may take a year for students to go from producing a set of 1 to producing a set of 4 items (Wynn, 1992). If a child has not had exposure or practice counting out sets of 1-5 items prior to entering PreK or K, they may not be able to master this concept and skill with just 5 rounds of exposure with game-based instruction. These children need more, and a different kind of handholding, to succeed. It can be done via additional content addressing mathematics readiness, targeting skills as early as distinguishing symbols as numbers vs. letter, and via providing many more opportunities for number naming and counting practice. These can be done within the app and beyond the app, by providing parents and caretakers with activities and instructional resources to help them engage with their children in mathematics prior to formal schooling.

Other Hypotheses

Another possible reason for the lack of progress of Low prior knowledge students may be that the language selection was not accurate for them. 37% of Low prior knowledge students and 33% of medium-low prior knowledge students played in their non-native language (i.e., an ELL learner fluent in Spanish uses the English version rather than the Spanish version of the app), compared to 17% of students in the medium-high and 14% in the high prior knowledge groups. This was primarily due to the teachers' decision to keep the app language in English. Future studies may explore this possibility by encouraging native language selection.

One last important consideration for the design of game-based instruction for young children is their executive functioning, specifically related to motor skills. Our frequent user testing ensured that most children can engage effectively with Mastering Math, but it remains a possibility that Low prior knowledge students may require additional scaffolding when it comes to interacting with a tablet. Future research can combine observations with click-level data to better understand, measure and monitor how executive functioning may affect learning within the games.

Conclusion

This study evaluated data from efficacy studies of an adaptive game-based mathematics digital curriculum for preschool students. Analyses revealed that preschool children with low prerequisite knowledge at the start of the school year were unable to progress effectively in the program. Results of this study confirm the need for the development of interventions that address early mathematics readiness skills for students and highlight important considerations for the development of educational technology for young children. Educational technologies provide important opportunities to provide reliable and equitable access to high-quality education and personalization at scale, especially in preparing children for success in

school. There are currently too few educational programs available that can address early mathematics readiness skills for students. This study calls for programs that can identify children who may not be able to take advantage of school instruction and provide appropriate interventions to address their needs prior to the onset of formal schooling.

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Contrastive Interlanguage Analysis of Modal Auxiliary Verb Usage by Japanese Learners of English in Argumentative Essays

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The IAFOR International Conference on Education – Hawaii 2020
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Abstract

This research argues that in writing Japanese non-native English speakers use English modal auxiliary verbs in a way that significantly differs from how native English-speaking students/teachers use them from two different perspectives: frequency of use and verb phrase structures (VPS) where modal verbs can occur. To this hypothesis, the use of nine central modals (*can*, *could*, *may*, *might*, *shall*, *should*, *will*, *would*, and *must*) by Japanese learners was compared with that by native English-speaking students and native English-speaking teachers respectively. This comparison was carried out using the International Corpus Network of Asian Leaners of English, which is one of the largest freely-available corpora of Asian learners' English. Frequency analysis revealed Japanese college students' overuse of *can*, *should*, and *must* as well as underuse of *will* and *would* as compared to native English speakers. VPS analysis revealed that Japanese students and native English-speakers shared different preferences for VPSs. Japanese students infrequently used the modals in the progressive and perfect aspect relative to native English-speakers. Overall findings suggest that teaching materials or language teachers should explain other modality items so that learners can have a wide range of lexical items to reflect their feelings more accurately, and should not teach them in exactly the same way because depending on the modals, preferences for VPSs were different.

Keywords: modal auxiliary verbs, corpus linguistics, contrastive interlanguage analysis, Japanese learners of English, the ICNALE corpus

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Introduction

For non-native English speakers, modal auxiliary verbs (e.g., *can, will, might*) are among the most challenging grammatical structures to master, something that has been widely recognized by many researchers (Cook, 1978; Decapua, 2008; Khojasteh & Kafipour, 2012; Mukundan & Khojasteh, 2011; Römer, 2004). The difficulty in using modal verbs can be attributed to their wide range of meanings (Holmes, 1988) or their unique rules about forms (Celce-Murica & Larsen-Freeman, 1999). Briefly explained, each modal has at least two different meanings and does not have inflected forms as in *she cans play the guitar* or *she canned play the guitar*.

Studies related to leaner's modal verb usage have been conducted for a number of non-native English speakers; for example, for Swedish (Aijmer, 2002), Chinese (Yang, 2018; Xiao, 2017), Indian (Wilson, 2005), Malaysian (Khojasteh & Reinders, 2013), Brazilian (Viana, 2006) and so forth. These studies all come to largely the same conclusion that learners' modal usage is problematic, one of the reasons that motivated me to conduct this study. Despite these facts, however, there are few studies in relation to the Japanese learners' modal usage.

One of the studies focusing on Japanese learner's modal usage is conducted by Fujimoto (2019). She compared the use of epistemic modal verbs (e.g., might, could) and epistemic adverbs (e.g., perhaps, probably) employed by Japanese university students with that by American/British English speakers in written corpora. Research findings indicated that Japanese students frequently used the modal verbs while they infrequently used the adverbs. In this research, one point that we can improve could lie in the methodology. Specifically, Japanese learner's language use was analyzed in a corpus that she created from writing assignments produced by students taking her academic writing course whereas English native speaker's language data was obtained from the existing corpora, which is available at https://cqpweb.lancs.ac.uk/. Differences in writing conditions including topics or allocated time to complete writing tasks can largely affect their products (Ishikawa, 2013). It would be, therefore, worth conducting a study on Japanese learner's modal verb usage in writing whose conditions are better controlled.

To obtain a clear picture of Japanese learner's modal verb usage, this research is carried out based on the concept of *Contrastive Interlanguage Analysis* (CIA), which was firstly proposed by Granger (1996). She explains that "CIA does not establish comparisons between two different languages but between native and learner varieties of one and the same language" (p. 43). When the focus of research is on learner language, she sees two types of comparison as being worthwhile: one is a comparison between learner language and native language, and the other is a comparison of different interlanguages of the same language. This research adopts the former approach to uncover characteristics of Japanese learner language.

Literature Review

This chapter introduces what English modal verbs are, and how they have been studied in the field of corpus linguistics.

Modal Auxiliary Verbs

English modals contribute to the role of making our expressions richer or expressing our own perspectives appropriately. Modal verbs are used

> "to give a proposition a degree of probability, to express one's attitude, and to perform various social functions, such as expressing politeness or indirectness when making requests, giving advice, or granting permission. […] When English speakers use a modal, they interject their own perspective and view a proposition more subjectively than when they simply use present or past tense. (Celce-Murica & Larsen-Freeman, 1999, p. 141)"

What this statement indicates is that speakers' or writers' lack of knowledge regarding modal verbs would mean that they might always end up expressing their propositions directly even if they would like to make their opinions more indirectly.

According to researchers (Coates, 1983; Depraetere & Reed, 2006; Kennedy, 2002), modal verbs are generally divided into three kinds of sub-classes: nine central modals (*will*, *would*, *can*, *could*, *may*, *might*, *shall*, *should*, *must*); semi-modals (*want to*, *be going to*); marginal modals (*need to*, *ought to*, *used to*). The use of the nine central modals is, in fact, decreasing year by year whereas that of the semi-modals is increasing in written English as exemplified by the Brown family of corpora (Leech et al, 2009). At the same time, they argue that the overall frequency of the nine central modals is much higher than that of the semi-modals, meaning that it would be valid to study the nine central modals as a first step for studies on Japanese learners' modal usage.

Verb Phrase Structure

Kennedy (2002) maps nine verb phrase structures (hereafter, VPS) where the nine central modal verbs can occur. In this paper I will use S1-S9 in order to refer to each of the VPSs.
S1: Modal alone (e.g. Who will go? I will.)
S2: Modal + bare infinitive (e.g. She will go there.)
S3: Modal + be + past participle (e.g. It should be done.)
S4: Modal + be + present participle (e.g. I should be cleaning the room now.)
S5: Modal + have + past participle (e.g. I should have done it.)
S6: Modal + be + being + past participle/adjective (e.g. This room should be being cleaned.)
S7: Modal + have + been + past participle (e.g. This door should have been fixed.)
S8: Modal + have + been + present participle (e.g. We should have been waiting for her.)
S9: Modal + have + been + being + past participle/adjective (He might have been being careless.)
The key point in VPS analyses is to identify differences in preferences that the modal verbs have for the VPSs between Japanese learner language and native language.

Corpus-based studies on modal verbs

Corpus linguists seem to have similar interests in modal verbs. Römer (2004) compared the use of the central nine modals occurring in the real world as exemplified by the British National Corpus (BNC) with that in German textbooks from three perspectives: frequency of occurrence, modal meanings, and syntactic surroundings (negative sentences, questions, set phrases, if-clauses, and passive construction) where each modal tends to co-occur. In conclusion, she made several suggestions for the treatment of the modals in textbooks to fill in gaps between the English used in the textbooks and that in the real world.

Khojasteh and Kafipour (2012) investigated to what extent Malaysian English textbooks reflected the modal use in the real world from the point of view of VPSs, and this was carried out by comparing the modal usage in BNC with that in a textbook corpus. In addition to their corpus-based findings, they used three more corpus-based findings for the purpose of the research: Kennedy's (2002), Mindt's (1995), and Mindt's (2000). Based on these, they revealed differences in frequency of contribution of each modal to each VPS between the English used in the real world and that in Malaysian textbooks. Consequently, they considered the underuse of several VPSs in the textbooks as being problematic and concluded that Malaysian textbook developers had ignored corpus-based findings.

Nordberg (2010) investigated if the use of the central nine modals occurring in Finnish EFL textbooks for upper secondary schools was similar to that in present-day English from two perspectives: frequency of occurrence and modal meanings. To this end, several corpus-findings representing the modal use in the real world were compared to occurrences within a textbook corpus, which was created by Nordberg himself. For frequency of occurrence, he revealed similarities between the two kinds of language data. For the modal meanings, however, he found that textbooks overemphasized the one-sided meaning for each modal in a way that differed from the present-day English.

In sum, previous studies seem to have been carried out mainly from four perspectives: frequency of occurrence, modal meanings, VPSs, and syntactic surroundings. As a first step for studies focusing on Japanese learner's modal usage, this research will pay special attention to frequency of occurrence and the VPSs where modal verbs occur; that is, the leading research questions are (1) which modal do Japanese learners of English over-/under-use as compared to native English-speakers? and (2) are there any differences in preferences that the modal verbs have for the VPSs between Japanese learners of English and native English-speakers?

Methodology

Corpus under Analysis

The *International Corpus Network of Asian English* (ICNALE), which is one of the largest freely-available corpora of Asian learners' English (Ishikawa, 2013), was adopted for the purpose of this CIA research. This corpus is created with the aim of conducting reliable CIA research; therefore, unsurprisingly, the writing conditions are strictly controlled. Specifically, all the writers wrote "about the same topic within the

same amount of time, and they produced essays of the same length and using the same PC environments and references" (Ishikawa, 2013, p. 94). Hence, results obtained from the corpus could potentially give us a reliable insight into learner language. The ICNALE corpus is composed of four kinds of modules: *Spoken monologue*, *Spoken dialogue*, *Written essays*, and *Edited essays*. Among these, only the *Written essays* module was used for the current study, meaning that the current study will leave analysis regarding the modal usage in spoken contexts open for further research. The *Written essays* module consists of the set of argumentative 200-300 words essays on two types of topic: one is *Is it important for college students to have a part time job?* and the other is *Should smoking be completely banned at all the restaurants in the country?*

In most CIA studies learner language has been compared with native-speaking student language as comparable language data (Granger, 1996; Granger, 2015; Ishikawa, 2013). On the other hand, Granger (1998) and Granger (2015) point out that the language produced by native-speaking experts should also be considered rather than focusing   only on native-speaking students since their language may not be what learners should imitate (Aston, 2008). The ICNALE corpus can display three types of native language data: native-speaking students, native-speaking teachers, and native-speaking adults (i.e., native speakers who have no experience teaching English). Among these, it would be reasonable to assume that the language produced by native-speaking teachers corresponds to that of native-speaking experts. Learner's language use is, thus, compared with two types of native language so that we can obtain a clear picture of learner language. The following table illustrates the inside information of the participants in the ICNALE corpus. In it, *JNNS*, *NESS*, and *NEST* refer to Japanese non-native students, native English-speaking students, native English-speaking teachers respectively; I will use these abbreviations to refer to each group of writers henceforth.

	number of writers	tokens
JNNS	400	177,253
NESS	100	44,749
NEST	44	19,867

Table 1: Information on the INCALE corpus

We can choose to use either the ICNALE online or the ICNALE download version. The latter version was adopted for this research because it gives access to updated data and allows for analysis of the corpus with other corpus tools that researchers would like to use.

Instrumentation

To reveal and compare frequencies of use of the nine central modals employed by the three groups, *Wordsmith Tools 7.0.* (Smith, 2016) was used; among several features that this program has, the *Concord* feature was used to call up a set of concordances having the modal verbs under analysis, allowing for analysis regarding the VPSs.

Analysis Results

This chapter is devoted to describing how the central nine modals are used by the three groups respectively from the primary perspectives in this research (i.e., frequency of use and VPS).

Frequency analysis

Table 2 summarizes how many times each modal is used by each group. Note that, this research excluded instances comprising the modals that are used grammatically incorrectly from the scope of analysis; therefore, Table 2 shows frequency of grammatically correct use of the modals. The following six cases represent the excluded ones.

(1) Modals are followed by two verbs.
…they would not *be enjoy* the meal. (W_JPN_SMK0_337_B1_1)
(2) Modals are followed by inflected forms of verbs.
…many companies and shops can *decreased* the payment of employee's wage. (W_JPN_PTJ0_019_B1_2)
(3) Modals are not followed by verbs.
…we should much more *friends* in a university. (W_JPN_PTJ0_277_A2_0)
(4) Modals are used in inappropriate verb phrase structures.
Secondly, a part time job *can be improved* student's communication skill. (W_JPN_PTJ0_350_A2_0)
(5) Verb tense is incorrect.
If I *did not do* part time job, I *could not do* these experiences. (W_JPN_PTJ0_062_B1_1)
This sentence is grammatically correct, but guessing from the context, this sentence should be, *If I had not done part time job, I could not have experienced these things*.
(6) The place of *not* is incorrect.
So he and his family will be *not* happy. (W_JPN_SMK0_098_A2_0)

In Table 2, the modal verbs have been put in descending order of frequency of use observed in JNNSs' essays. The numbers in parentheses represent the order ranked by frequency of use in each group.

Modal	JNNS	NESS	NEST
can	1755	329 (1)	100 (3)
should	1314	271 (2)	101 (2)
will	719	260 (3)	99 (4)
may	363	67 (5)	55 (5)
must	327	14 (8)	16 (7)
would	154	203 (4)	112 (1)
could	130	38 (6)	23 (6)
might	65	31 (7)	8 (8)
shall	1	2 (9)	1 (9)
TOTAL	4828	1215	515

Table 2: Frequency of use in each group

JNNSs and NESSs share the same tendency for the high frequency modals. Both groups use *can* with the most frequency, followed by *should* and *will*; however, the frequency order of all the other modals except for *shall* does not match each other. For example, NESSs infrequently use *must* as compared to JNNSs while they use *would* more frequently than JNNSs.

Compared to NESTs, gaps in frequency order seem to widely differ as compared to those observed in the comparison with NESSs. NESTs use *would* with the most frequency whereas it is one of the mid-frequency modals in JNNSs' essays. The modal *must* belongs to the low frequency modals in JNNSs' essays whereas it would be categorized into mid-frequency modals in NESSs' essays. Overall, JNSSs often use the modals that NESTs tend to infrequently use in their writing.

To see whether or not these gaps in frequency of use are statistically significant, I performed a log-likelihood test on the data. This testing can better uncover under-/over-used items in experimental corpora relative to reference corpora (Seog & Choi, 2018); this is valid when the sizes of corpora to be analyzed are quite different from each other (Rayson & Garside, 2000; Yae, 2015). The web-based statistical tool which was developed by Paul Rayson was used for a comparison of frequency of use, allowing us to reveal if differences in frequency between two language data are statistically significant with a log-likelihood value. This is freely available at http://ucrel.lancs.ac.uk/llwizard.html.

Modal		Log-Likelihood	Bayes Factor**
can	+	26.25*	13.94
should	+	9.60	-2.71
will	-	23.24*	10.93
may	+	5.96	-6.36
must	+	75.25*	62.94
would	-	231.43*	219.12
could	-	0.61	-11.70
might	-	7.79	-4.52
shall	-	3.04	-9.27
TOTAL	+	0.01	-12.30

*: statistically significant at the level of *p* <.05
**: degrees of evidence against the null hypothesis
Table 3: Result of a log-likelihood test- JNNS vs NESS

Table 3 summarizes the result of a log-likelihood test on a comparison of frequency of modal use between JNNSs and NESSs. Considering Bayes factors, the data identifies that JNNSs overuse *can* and *must* as well as underuse *will* and *would* at a level that is statistically significant.

Modal		Log-Likelihood	Bayes Factor**
can	+	53.23*	41.04
should	+	14.88*	2.69
will	-	3.50	-8.69
may	-	4.03	-8.16
must	+	13.58*	1.39
would	-	184.65*	172.46
could	-	3.66	-8.53
might	-	0.06	-12.13
shall	-	2.03	-10.16
TOTAL	+	1.16	-11.04

*: statistically significant at the level of $p < .05$
**: degrees of evidence against the null hypothesis
Table 4: Result of a log-likelihood test- JNNS vs ENST

Table 4 illustrates the result of a log-likelihood test on the differences in frequency of use between JNNSs and NESTs. According to this table, JNNSs overuse *can*, *should*, *must* as well as underuse *would* relative to NESTs at a level that is statistically significant.

VPS analysis

This paper has already stated that the VPSs to be analyzed will follow the Kennedy's taxonomy as summarized above; however, among the nine VPSs, the central nine modals rarely occur in S6-S9. Specifically, in the whole data there are only two instances occurring in those structures, all of which are produced by ENSSs. Thus, these VPSs are excluded from the scope of analysis because such a small number of instances would not be enough to discuss and generalize results, leading to an extreme interpretation.

Table 5 compares the distribution of the VPSs where each modal occurs in JNNSs' writing with that in NESSs' writing, and results are expressed as a percentage.

	S1		S2		S3		S4		S5	
	JNNS	NESS	JNNS	NESS	JNNS	NESS	JNNS	NESS	JNNS	NESS
can	1.8	2.4	96.4	93.6	1.7	4.0	0.1	0.0	0.1	0.0
could	0.0	2.6	96.2	86.8	2.3	7.9	0.0	0.0	0.8	2.6
may	0.3	0.0	95.0	88.5	3.9	6.5	0.8	3.8	0.0	1.2
might	0.0	1.0	92.3	86.2	6.2	6.9	1.5	0.5	0.0	4.9
will	0.4	0.0	94.0	85.1	4.9	4.5	0.3	1.5	0.1	7.5
would	0.0	0.0	94.2	87.1	3.9	0.0	1.9	0.0	0.0	12.9
shall	0.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
should	0.0	0.7	62.6	64.2	37.3	33.9	0.0	0.7	0.2	0.4
must	0.0	0.0	92.4	85.7	7.3	14.3	0.0	0.0	0.3	0.0
TOTAL	0.7	1.1	86.3	83.8	12.5	11.9	0.2	1.2	0.1	2.0

Table 5: Distribution of the VPS where modal verbs co-occur- JNNS vs NESS

Overall, both groups use the modals in S2 with the most frequency, followed by S3. What is noteworthy in this data can be that in JNNSs' writing S4 and S5 respectively account for only 0.2% and 0.1% of all the instances, meaning one sixth and one twentieth of the incidences occurring in ENSSs' essays. This implies that JNNSs seem to infrequently use the modal verbs in these structures as compared to NESSs. In addition, the data shows that JNNSs rarely use the modal verbs in S1.

Looking closely at each individual modal, another fact to mention is the difference in the use of the modal *may*, which is the modal occurring in S4 most frequently in NESSs' essays while this case rarely occurs in JNNSs' essays. The differences in the use of *will*, *would*, and *might* between the two groups should be another point to note. In NESSs' essays these modals frequently occur in S5 as compared to the other modals whereas in JNNSs' essays, they seldom occur in the structure, implying that depending on the modals, their preferences for the VPSs may vary.

	S1		S2		S3		S4		S5	
	JNNS	NEST	JNNS	NEST	JNNS	NEST	JNNS	NEST	JNNS	NEST
can	1.8	9.0	96.4	81.0	1.7	10.0	0.1	0.0	0.1	0.0
could	0.0	0.0	96.2	65.2	2.3	34.8	0.0	0.0	0.8	0.0
may	0.3	0.0	95.0	92.9	3.9	6.1	0.8	1.0	0.0	0.0
might	0.0	0.0	92.3	92.0	6.2	1.8	1.5	3.6	0.0	2.7
will	0.4	0.0	94.0	80.0	4.9	12.7	0.4	1.8	0.1	5.5
would	0.0	0.0	94.2	100.0	3.9	0.0	1.9	0.0	0.0	0.0
shall	0.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
should	0.0	1.0	62.6	60.4	37.3	36.6	0.0	2.0	0.2	0.0
must	0.0	0.0	92.4	81.3	7.3	12.5	0.0	6.3	0.3	0.0
TOTAL	0.7	1.9	86.3	81.2	12.5	14.0	0.2	1.7	0.1	1.2

Table 6: Distribution of the VPS where modal verbs co-occur- JNNS vs NEST

According to Table 6, both groups use the modals in S2 with the most frequency, followed by S3. The differences in the use of S4 and S5 between the two groups seem to widely differ as compared to those of the other VPSs. Specifically, NESTs use the modals in S4 8.5 times and in S5 12 times more than JNNSs. These facts that JNNSs infrequently use the modals in S4 and S5 relative to NESTs are identical to the results observed in the comparison between JNNSs and NESSs.

A close look at an individual modal reveals that the modal *could* occurring in S3 accounts for 34.8% of all the instances, meaning the rate is 15 times more than that in JNNSs' writing. Most occurrences of S1 tend towards the use of *can*. Besides, the modal *must* contributes to S4 in NESTs' essays most whereas JNNSs do not produce this modal in the structure. Focusing on the modals co-occurring with S5, we can see that in NESTs' writing the modal occurring in S5 most frequently is *will* whereas this use is rare in JNNSs' essays, again indicating that each modal seems to have different preferences for the VPSs.

Discussion

This CIA research has revealed several points worth discussing. The results did not show any significant difference in overall frequency of use between JNNSs and both of the native speaker groups, which is contrary to what previous studies have shown. Those studies identified the learners' overuse of modal expressions (Aijmer, 2002; McDouall, 2012; Xiao, 2017; Yang, 2018) or underuse of them (Fujimoto, 2019; Seog & Choi, 2018) relative to native speakers. Looking at the modal usage at an individual modal level, however, this current study can highlight some notable differences.

Frequency analysis also uncovered JNNSs' overuse of *can* and *must* as well as underuse of *will* and *would* at a level that is statistically significant relative to both of the native speaker groups. First, it is interesting to note that both of the underused modals are members of so-called epistemic modals. In writing, they have an important role because they are used to not only confer author's judgment or evaluation on truth value to their statements, but also build a relationship with readers (Palmer, 1990; Hu and Li, 2015). Using these expressions appropriately would be, thus, the key factor to make one's writing more readable.

Leech et al. (2009) identified that in written contexts, the modal *would* was used most frequently, followed by *will*. Both modals were the modals that their epistemic meanings (i.e., prediction) were dominant rather than their root meanings (i.e., volition/intention) as exemplified by the Longman Spoken and Written English Corpus (Biber et al., 1999). That is, native English speakers may often use the two modals to convey epistemic modality in writing, leading us to argue that filling in the gaps in the use of the two modals can potentially help bring Japanese learner's modal usage in writing close to the native-like usage; therefore, student's underuse of *will* and *would* is a problem which needs to be addressed.

Two of the modals, *can* and *must*, are overused by JNNSs as compared to both of the native speaker groups. There may be several reasons for this. First, the fact that the modal *can* is overused and produced by learners of English most frequently is identical to what previous studies have identified (Btoosh, 2019; Viana, 2006; Yang, 2018). This might be, therefore, a common trend among learners of English. As is well known, the modal *can* can convey three different meanings: permission, possibility, and ability. These meanings are supposed to be acquired by learners even if they are at an early stage (Coates, 1982; Seog & Choi, 2018). As mentioned earlier, modal verbs are among the most challenging items for learners of English. Hence, it is possible that JNNSs used *can* more frequently than the other modals because it might have been the only modal that they were able to use with confidence.

The learners' overuse of *can* and *must* can be potentially explained by the *One to One Principle* (Anderson, 1984), which is the idea that if learners decide to use one form to express one meaning, they would rely on it and would not use other equivalent expressions. For example, the meaning of *can* regarding possibility could be expressed by other lexical items such as *perhaps* or *probably*. Likewise, equivalent expressions of *must* conveying certainty could be paraphrased using *definitely* or *undoubtedly*. In her study, Aijmer (2002) identified that Swedish learners of English tended to overuse modal verbs to express modality, and she considered that this was partly due to EFL/ESL textbooks overemphasizing modal verbs and

underemphasizing other lexical items to express modality. Considering these findings, one possible interpretation is that JNNSs overuse *must* and *can* because they rely largely on the two modals to express modality that they can convey and ignore other equivalent expressions. At the same time, it should be pointed out that we cannot strongly argue this point yet because the current study focuses on the modal verbs only. Thus, what induces learners' overuse of the two modals should be researched more in the future.

Another aspect of this study which should be pointed out is that the modal *should* was found to be a high frequency modal whereas many previous studies identified that it was a member of the mid-frequency modals in the real world (Kennedy, 2002; Seog & Choi, 2018) It was also revealed that the modal was often used in the passive voice. This fact is not surprising because one of the essay topics in the ICNALE corpus is *Should smoking be completely banned at all the restaurants in the country?* Referring to instances of *should* produced by the three groups, we can easily find that all the groups often borrow the expression from the indication sentence.

Semantically speaking, the modal *should* has the function of giving advice. Writers were required to write essays argumentatively; therefore, we can imagine that they would have used this modal to give advice or made a suggestion so as to persuade readers with their arguments. According to researchers (Biber et al., 1999; Leech, 2004; Leech et al., 2009), depending on genres where the language is produced, its language behavior quite varies, meaning that the frequent use of *should* can be one example of what previous studies have shown.

As for the VPSs, both Japanese students and native English-speakers use the modal verbs in S2 with the most frequency, followed by S3. Focusing on the other VPSs, one thing that is noteworthy is that in JNNSs' essays, there are few occurrences of S1 (0.7%). However, this may not be surprising because such use mainly serves as ellipsis in conversational contexts (Kennedy, 2002), meaning that discussing the reasons for the infrequent use of S1 in writing would not give us a valuable insight. JNNSs rarely use the central nine modals with the progressive aspect (i.e., S4) as well as the perfect aspect (i.e., S5) as compared to the two native English-speaker groups. Although co-occurrences of modal verbs with the progressive aspect are not so frequent (Biber et al., 1999; Kennedy, 2002), this use should not be ignored because this can remove ambiguities in interpretations of modal meanings. According to Palmer (1990), the modal *must* as in "He must come tomorrow" (Palmer, 1990, p. 54) conveys the meaning of obligation as well as expresses speaker's certainty. By changing the sentence into "He must be coming tomorrow" (Palmer, 1990, p. 54), such ambiguity can be removed. Having a knowledge of this usage could be helpful especially for low-level learners because they are more likely to produce semantically ambiguous sentences than high-level learners.

Another fact to note would be that JNNSs infrequently use the modals with the perfect aspect. When referring to past events or actions, modal verbs are usually followed by the perfect aspect. The lack of learners' ability to use the modals with this aspect could mean their failures to express their subjectivity on something that happened in the past. Besides, one of the main roles of the modal verbs co-occurring with this structure is to express past unreal situations. In his article, Bryant (1975) pointed out that this usage was one of the common mistakes among Japanese learners of English,

suggesting that teaching materials or language teachers should carefully teach how to use the modals with the perfect aspect.

Suggestion for further studies

This study left several topics concerning learner's modal usage open. First, this research did not investigate whether or not there were any differences in the use of the modal verbs depending on learner's proficiency levels even though the ICNALE corpus can call up the language produced by a specific level of learners classified by CEFR levels. If future studies could identify typical mistakes which are particular to certain levels of learners, it would lead us to understand learner's developmental sequence.

It can also be worth investigating what induces learner's over-/under-use of certain modals. Aijmer (2002) points out that L2 learner's modal use may be influenced by many factors including learner's cultural value in their L1, textbooks, or teachers. Identifying the most influential factor on learner's modal use can offer a helpful insight into the way to teach them effectively.

Conclusion

The primary questions were (1) which modal do Japanese learners of English over-/under-use as compared to native English-speakers? and (2) are there any differences in preferences that the modal verbs have for the VPSs between Japanese learners of English and native English-speakers? As for the first research question, one of the significant findings was the Japanese students' underuse of the epistemic modals that native speakers would be more likely to use in writing. Given that the language produced by native speakers is the goal that learners should achieve, the underused modals should be more stressed in classrooms. In addition, the results revealed the overuse of *must* and *can* by Japanese learners. Introducing other lexical items having similar functions with the two modals can be helpful so that learners have a wide range of lexical items to reflect their feelings more accurately.

As for the second question, the results indicated that JNNSs tended to use the modal verbs in S2 and S3; they infrequently use the modals in S4 and S5 relative to native English-speakers. This may be one of the problems to combat because a situation is presented from different perspectives and viewpoints, and one verb form cannot describe every situation (Smith, 1983). It may be, however, hard for learners to acquire all the forms that modal verbs can take because they can co-occur with a wide range of VPSs. Fortunately, the results obtained in this study can potentially help propose a solution for this. This research excluded several of the nine VPSs from the scope of analysis because their occurrences were quite rare. Besides, the results showed that depending on the modal verbs, their preferences for the VPSs quite varied. That is, English teachers do not have to teach all the modals in exactly the same way; this information would give English teachers a helpful insight into which modal should be more prioritized in which VPSs.

The current study has shown that CIA research can be valid to obtain a picture of learner's interlanguage for at least the modal usage. Unsurprisingly, the next step would be to investigate how we can fill in gaps between learner language and native

language. One suggestion can lie in the improvement of textbooks because the content and curriculum of English classes in Japan tends to be largely dictated by the contents of the textbooks used (Hino, 1988). Using corpus-based textbooks can expose learners to language patterns occurring in the real world, leading them to acquire the native-like language use.

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A Practical Theory of Lifelong Learning Assistance for Promoting Community

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Abstract

"Community planning of lifelong learning" has been a common theme within the lifelong learning policy of Japan since the late 1980s. While community promotion has never been the main aim of activating each citizen's learning activity, it has been reported that promoting lifelong learning activities throughout a particular region has led to the effective empowerment of community. This paper explores and proposes new practical educational theories, taking these facts into account. It suggests that we need to expand the concept of education and simultaneously reverse our way of thinking by reconsidering relationships between education and learning. Here, some recommendations are made. First, education must be redefined not only as a concept focused exclusively on the nurture of each individual, but also as a relational concept with the capacity to foster human relationships. Second, the concept of educational space must be reconfigured, not so much based on educators and teachers, but on learners. We need to adopt a learner-based theory that learners live in the world which consists of five layers, as follows: absence of learning, learning as a result of experience, learning activities, receiving education, and being taught. Third, it is necessary and effective to create a theoretical framework that can function both as an analytical guideline and a pragmatic indicator. Individual learners' actions are simplified and categorized according to three basic types of activities－input, output, and intercommunion.

Keywords: human relationships, learner-based theory, individual learners' actions

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Introduction

Lifelong learning breaks free from the traditional concept of education typified by school education. It necessitates widening the category in which the concept of learning and education is covered. First, in reconfirming the term "lifelong" in terms of time-theory, learning and education is not only connected to the early stages of life, but also to the whole life. Based on the idea that education can be carried on from birth till death, all human beings including a small child, a young adult, the middle-aged, and elderly people must be taken into consideration as potential educational objects. Second, in amplifying the meaning of the term "lifelong" from a space-theoretical viewpoint, it is certain that spaces of education and learning are not only schools, but also various places such as homes, workplaces, communities, and online spaces as well. If society tries to attain a cradle-to-grave educational system, it must be noted that education and learning take place everywhere in the world.

However, lifelong learning goes beyond the scope of receiving education, and it requires a significant imaginative leap to debunk traditional stereotyped views of education. I have come to understand this through multiple means, not only from some abstract theories of lifelong learning, but also from witnessing how the effects of lifelong learning assistance accumulate and collectively lead to community empowerment. In this paper, I explore and propose new practical theories of education, founded on a redefinition of the concept of education.

Lifelong Learning and Community Planning in Japanese National Education Policy

When social changes are rapid, accelerating, and very difficult to forecast, education cannot but vary with the changing times. Accordingly, the concept of education must be accompanied by radical changes in the traditional concepts of education and schooling.

Lifelong learning is a concept known to target not only adults, including the elderly, but people of all generations from birth to death. The idea of lifelong learning helps in overcoming the fixed idea that education exists only within schools and in rediscovering that schools are not the only educational and learning spaces; various other places such as the home, workplace, community, mass media, and online media also serve this purpose.

In 1971, the Central Council for Education in Japan theoretically pointed out the limitations of "school-centered education" and stated that educational agents and stakeholders must take into consideration various elements that consciously or unconsciously influence human character formation when redefining education.

In 1981, "lifelong education" was defined in close association with the provisional definition of "lifelong learning" as a concept emphasizing its spontaneous nature in a report of the Central Council for Education in Japan on "Lifelong Education." In the mid-1980s, the Ad Hoc Council on Education under the direct control of the Prime Minister attempted to promote a "shift to a lifelong learning system." Since then, national educational authorities have exclusively used the phrase "lifelong learning," rather than "lifelong education." It is not the term "education" but the term "learning" that was adopted quite deliberately in Japanese lifelong learning policy at that time.

In the late 1980s, the idea of "community planning of lifelong learning" was proposed in the context of the comprehensive educational policy. This proposal led to quantitatively enriching the construction of educational facilities in Japan as centers of lifelong learning, with libraries, museums, cultural halls, and so on, from the late 1980s to the early 1990s. As building construction was given high consideration in community planning in those days, the hardware side of lifelong learning promotion took priority over quantitative and qualitative improvement of the software side, which included educational contents and methods.

In the mid-1990s, the Council on Lifelong Learning compared "community planning for lifelong learning" with "community planning through lifelong learning," considered two typical choices of "community planning of lifelong learning." The former was the idea that it is necessary for each municipal organization to create a regional environment for inhabitants of the district to perform various learning activities anytime and anywhere, while the latter was the idea that it is important for local residents to apply the learning outcomes acquired through their learning activities for the promotion of the community.

Creating a circulatory relationship between "community planning for lifelong learning" and "community planning through lifelong learning" is vitally essential for the promotion of community to succeed. In short, we must create effective reciprocity between learning activities and the application of learning outcomes.

Critical Reconsideration of the Basic Concepts of Education

I believe that careful conceptualization of lifelong learning offers an advantage in theorizing and investigating education. Lifelong learning means going beyond the scope of prolonging the span of school education, and it requires a great leap of imagination to debunk some traditional stereotypes of education.

First of all, we must destroy an ambiguous borderline between education and learning, although, so far, "lifelong education" and "lifelong learning" have been very often viewed as being synonymous. The distinction between education and learning is the most fundamental when we discuss the importance of lifelong learning assistance. The subjects of education are educators including teachers, while the subjects of learning are learners including students.

Second, learning is different from being taught, although many passive learners regard these two concepts as the same. To be sure, being taught something leads mostly to learning it, and not being taught something generally results in not learning it, but being taught does not necessarily lead to learning, and not being taught something does not prevent it from being learned. Taking account of the theoretical feasibility of the last two cases, we discover that being taught is only one means of learning. In reality, human beings can learn something anytime; when they are working, playing, and housekeeping, not to mention studying at school.

Third, we must not conflate education and teaching. Indeed, teaching is one effective method of education, but it is not only a means of assisting learners. On the contrary, not teaching is sometimes more effective than teaching, partly because the former situation compels learners to abandon their passivity, making them independent of

educators and promoting self-direction. This is why we must not confine education to the relationship between teaching and being taught. The flip side is that human beings learn various things by communicating with other people, communities, media, nature, and so on.

Taken together from my theoretical point, the difference between education and learning must be clarified through a shift from relational issues in the cognition or action, to relational ones between "subject" and "object." As compared to the distinction between "teacher" and "student" in the context of school education, we must adopt the fundamental distinction between "educator" and "learner" in the context of promoting lifelong learning. Stressing the most fundamental point in advance, lifelong learning is an idea based less on educators than on learners.

The Scheme of Learner-Based Educational Theory

In provisional conclusion, we need learner-based educational theory to create, practice, and analyze lifelong learning assistance for promotion of community. Let me develop the structural discussion of learners' opportunity to learn something. Figure 1 exhibits the whole framework, comprising five layers, namely, absence of learning, learning as a result of experience, learning activities, receiving education, and being taught.
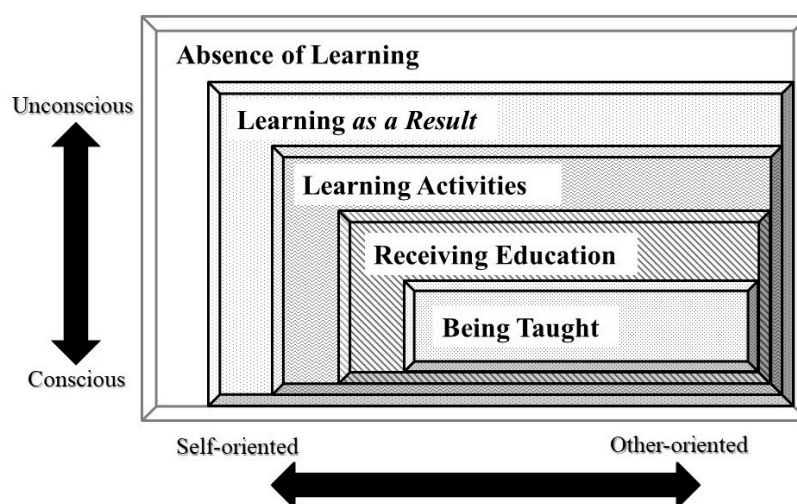
Figure 1: Learner-based educational scheme

As a preliminary argument, we must strictly distinguish between "learning" and "learning activity." The former concerns learners' cognition, but the latter concerns learners' action. The former can exist when a person could have learned something as a result of some experience regardless of whether the learning process was purposeful, but the latter can exist when a person executes concrete action such as reading books and taking classes, irrespective of whether the learning effect leads to success. In sum, learning activity is defined as intentional, in order to actualize the situation for a person to have learned something as a result.

In reality, a human being does not always become a learner even though he or she might be a learner by nature. It is not until a person can become a learner that he or she comes to learn something. On ground zero, we assume the possible existence of opportunities for someone to learn nothing.

At the first level, a living person becomes a learner as soon as he or she has some lived experience and has thus learned something. There exist opportunities for someone to have learned something *as a result*. A learner can exist without educators.

At the second level, a person can execute learning activities as intentional acts, and then he or she certainly deserves the name "learner." There exist opportunities for a learner to practice intentional learning activities. A learner can spontaneously choose the content and methods of learning activities.

At the third level, a learner can choose to embrace the opportunity of receiving education, including schooling, as one of the methods of imparting learning activities. A learner can receive education without being directly taught by someone, such as being endowed with the right to enjoy free access to libraries and museums. Also, receiving education differs from being educated although very few people including educators can distinguish them. Being educated is an effect by which a learner may be influenced, but the receiving education is a choice that a learner can select alone, proactively. In both cases, a learner needs educational others, whether consciously or unconsciously.

At the fourth level, a learner can choose the opportunity of being taught by others, including teachers, as one learning method for receiving education. Indeed, being taught is a passive action, but it is, at the same time, an action that enables a learner to choose independently. If a learner is aware of his or her limitations of self-study, theoretically, he or she can select to be taught by someone, including professional persons, although this situation does not always manifest itself in actuality.

Schematically, a learner's lifeworld theoretically consists of five layers, as follows: absence of learning, learning as a result of experience, learning activities, receiving education, and being taught. Thanks to this abstract theory, we can reverse our way of thinking by reconsidering relationships between education and learning. As an implicit premise, learner-based theory is essential and effective for associating lifelong learning promotion with community planning.

Human Relationships as a Key Concept of Lifelong Learning Assistance

In recent years, the concept of the "No Connection Society" (*Muen-shakai* in Japanese) has been widely discussed in Japan. According to the TV program that first coined the expression in January 2010, in the past one year, approximately 32,000 Japanese people died solitary deaths, their bodies remaining unclaimed. These are individuals who lacked connections to their families, relatives, neighbors, colleagues, or friends at their time of death. As such, they were isolated from society until death. The "No Connection Society," therefore, is a paradox doomed to extinguish social connections.

Many young people with good online social networks reacted strongly to this television program, worrying about their future lives. Most of them made comments such as, "Solitary death concerns me too." They were completely aware that online connections are, in many cases, superficial in terms of the depth of human relationships. Some of them understood that even though they were aware of beneficial information about humanity, they failed to connect to human beings.

In sum, a disparity exists between the economically advantaged and disadvantaged with regard to opportunities to communicate with others and to foster communication capabilities. Indeed, some individuals are skilled in both face-to-face and IT communication. However, others avoid face-to-face conversation, regardless of their abilities in using IT-related equipment and systems. Furthermore, an increasing number of Japanese people do not maintain healthy human relationships. In part, this is due to the convenience of modern life that allows people to live comfortably while maintaining minimal contact with others. In addition, recent harsh economic circumstances have prevented many economically disadvantaged people from participating in the highly sophisticated information society. Thus, the reconstruction of social human bonds is imperative.

Apart from this prevailing situation in Japan, innumerable efforts have been made to provide learning opportunities for adults, including the elderly. Research reveals the importance of qualitatively and quantitatively enriching human relationships, in order for community members to become active learners. While community promotion has never been the primary aim of activating active citizen learning, it has been reported that promoting regional lifelong learning activities leads to the effective improvement of the community. Therefore, we should focus on accumulating lifelong learning practices as a means to exploring solutions to the "No Connection Society."

At the strategic level, we need to establish social goals to realize a human society with abundant mutual trust among all members. Human relationships do, in principle, benefit the social infrastructure, which not only protects society but also creatively activates it.

At the tactical level, we need to develop educational programs for learners to encourage their social interaction, have them experience the joy of communication, and enhance their communication skills. After reconsidering the time allocated for individual activities and devising various learning-space designs, educators should make the most of the diversity and dynamism resulting from flexible horizontal relationships among learners instead of clinging to static vertical relationships between lecturers and students.

At each practice level, we need to adopt many techniques to achieve joyful and active learners because the motivation to learn depends greatly on the strength of human relationships among learners. For example, a conscious or unconscious sense of reassurance based on interrelationships of mutual trust can serve as a locomotive for effective learning. It is important to set a harmonious tone for learners to respect each other. If possible, learners should be able to enjoy communication with other learners.

Educational Methodology for Effectively Combining Learning Outcomes and Rich Human Relationships

The accumulation of rich human relationships created through learning activities that promote active collaboration, including mutual face-to-face encounters, leads to optimal social efficiency. This enables the promotion of effective community design among community members. For this reason, education as part of lifelong learning promotion must be redefined, so that it is seen not only as the process of teaching individuals, but as the fostering of mutual trust, despite educational evaluation being

restricted to the individual.

Indeed, we have adopted many concrete practical techniques to assist lifelong learning. However, these methods still leave space for originality and ingenuity. The development of educational methods to effectively combine learning outcome with rich human relationships is very important. Some basic theoretical ideas that can simply and straightforwardly function as both analytical guidelines and pragmatic indicators are required.

I will now attempt to propose a new methodological framework for the practice of lifelong learning that focuses on a simple arrangement of how to learn. First, I want to show this whole scheme as Figure 2, which constitutes three basic types of correlated activities – input, output, and intercommunion.
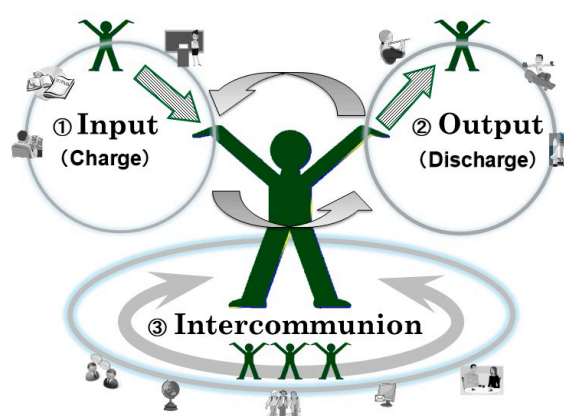

Figure 2: Three basic types of learners' actions

Learning involves nurturing one's inner self by absorbing something from the outer world, such as information, knowledge, wisdom, skills, abilities, and experience, by attending lectures, reading books, watching television, practicing skills, and so on. In contrast, self-expression activities, such as artistic activities, sports, voluntary actions, and work, can be regarded as consciously or unconsciously applying and harnessing learning outcomes. Schematically, learning itself corresponds to input, while applying learning outcomes to one's life corresponds to output. To make an analogy to an electric machine or a battery, input corresponds to charge, while output corresponds to discharge.

The interaction between input and output can generate dynamic synergetic effects. The more learning outcomes an individual inputs or charges through further learning, the greater that individual's appetite for output or discharge. In contrast, the more learning outcomes an individual outputs or discharges, the more learning is necessitated, due to the individual's discovery of a need for learning. In this way, input activities promote output activities, as discharge activities promote charge activities. The more input, the more output. The more discharge, the more charge.

In addition, an individual can make his or her life complete by repeating this process. It often seems that older learners, with abundant life experience, remember past events and rediscover wisdom preserved unconsciously in their lives and, as a result, become self-affirmative.

However, it must not be forgotten that this interactive relationship cannot be realized by the individual alone, and that more than one person is required. An interrelationship based on an input-output interaction always requires an interpersonal human network. Therefore, I recommend that learning programs include the introduction of human interactions, where educators effectively cross-fertilize learners from different backgrounds. Communicative learning activities can help learners to realize the harmony between relaxation and concentration. I call this situation "intercommunion," because of its ability to create deep associations between individuals or groups.

Considering the broader scope of individual learners' actions, I maintain that lifelong learning consists of three types of activities – input, output, and intercommunion. The third level is directly relevant to human relationships, but the other two are also closely related to matters of human connectivity. I firmly believe that it would be effective for learners to experience the three types of activities—charge, discharge, and intercommunion—as a combination, like the three corners of a triangle.

Conclusion

Education is to be understood as nurturing a person through instruction. However, we must be bold enough to change the ground rules for the traditional concept of education, taking account of the fact that lifelong learning assistance can lead to community empowerment.

First, education must be redefined as a concept that goes beyond the individual to form a relational concept in human relationships. When we try to create the circulative relationship between "community promotion *for* lifelong learning" and "community promotion *by* lifelong learning," education also should be understood as fostering the human relationships between individuals and groups rather than teaching individuals. This idea must be made central in our highly networked information society, where the quality of communication has become impoverished, regardless of its quantitative richness.

Second, the concept of educational space must be reconfigured; it should prioritize learners instead of educators and teachers. We need to reverse our way of thinking by reconsidering relationships between education and learning, and adopt a learner-based theory that learners live in the world which consists of five layers, as follows: absence of learning, learning as a result of experience, learning activities, receiving education, and being taught.

Third, the concept of learning actions must be broadened to reflect the fact that actual learners learn in a variety of ways, anytime and anywhere. As we implement lifelong learning assistance, it becomes necessary and effective to create a theoretical framework that can function as both an analytical guideline and a pragmatic indicator. Broadly simplifying individual learners' actions, I maintain that they consist mainly of three basic types of activities－input, output, and intercommunion.

These theoretical proposals are a product of my observation of various efforts in Japan to provide many learning opportunities for adults including the elderly. I

propose that we should reconsider educational potential by taking into account the cumulative benefits of lifelong learning assistance.

Acknowledgment

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Teaching English to Refugees in Greece: The Case of Lexena School

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Abstract
In the last year Greece has experience an influx of refugees, this has been associated with forces having a highly destructive character, resulting in a continuing transformation of existing notions concerning the proper forms of teaching and boundaries of such fundamental phenomena as culture and education. Integration processes have also involved dramatic changes in national education systems, which are currently facing a number of considerable challenges. The aim of this paper is to examine the current practices of language teaching in refugee schools, report on the challenges teachers and students encounter, as well as suggest possible ways of facing them. It reports on a research project in a secondary refuge school in Greece. The strategy of research applied in this study is grounded on theory and the qualitative methods of research are: structured interviews (10 interviews done and transcribed during one month), scaled questionnaires were distributed (80 done during one month and transcribed) and photography (800 photos done during one month and described) and repeated visits in the school. There were at least 80 students involved at the project during six months. Moreover this presentation draws on content analysis as a systematic, rigorous approach to analyzing documents obtained or generated in the course of research. The paper will conclude on how barriers and challenges can be met and will suggest practical, uncomplicated advice for teachers on how best to support children who have experienced trauma and what they can do to help vulnerable children learn and develop their full potential.

Keywords: refugee, English language teaching, special refugee schools, teaching in challenging circumstances

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Introduction

In an increasingly globalized and multilingual world, contemporary trends in migration, as well as historically high numbers of forced displacement, have created challenges for the educational systems in destination countries, as children from a variety of linguistic and educational backgrounds join mainstream schools or study in refugee camp schools. Approximately one in 30 (3.4 per cent) of the world's population are migrants (United Nations, 2017). Reasons for their migration to a new country vary, and include a shortage of labor in certain sectors, the desire to join family members living elsewhere, or, as refugees, to escape war, civil unrest and/or poverty (INHCR 2017). While most refugees remain close to their home country – according to UNHCR (2017), migration to more prosperous and peaceful countries continues to grow (Simpson, 2016). Consequently, the proportion of 'students with an immigrant background' now constitutes over 12 per cent of the world's school population (OECD, 2015: 1). Language plays an important role in adjusting to the new environment (De Jong 2010; Ward et al. 2001). The newcomer's task, however, of adapting to life in a new country is often complicated by the need to acquire a new language. Obviously, language is not the only concern of refugees in their new environment; however, one measure of refugees' overall success in adapting to their new environment is the extent to which they are successful in learning the language of their host country (Sharples 2016). In Greece, over one in six children are studying through the medium of EAL , English as an additional language, meaning "students that use two or more languages in their everyday life" (Hall 2018:12), a figure that has risen by 20 per cent since 2006 (Department for Education, 2016). Hence, students studying in the same institution may vary not only in terms of their geographical origin and language background, but also in terms of their educational history and experience, levels of literacy in their own or main language(s), and immigration status and reasons for migration. Moreover, the Greek government, in order to cater for the increased needs of a growing number of refugee children, has established more than 100 hundred refuge schools, called DYEP (structures for welcoming and educating refugee children).

The aim of this paper is to examine the challenges and problems that emerge from teaching English to DYEP schools. This article is written from the scope of those teaching this diverse group of adults and children in such schools; in a country/area where Greek is often the dominant language, of a substantial, often monolingual, majority and where learners need English to communicate in their everyday life. Underlining the need to extend the boundaries of the discipline of EAL to include teaching-learning in less privileged contexts, this paper will emerge in describing the current situation in refugee camp schools as well as identify the obstacles faced by teachers who work in these schools. The paper will also present multiple ways of thinking about how to overcome the existing challenges, generate an insight and develop understanding of teacher experiences. Finally it will give a description of different classroom activities and instructional strategies the teachers employed in their classroom with newcomer refugee children.

1. Refuge schools (DEYP)

The Greek Educational system entitles all students in the state funded education to experience the same processes and curriculum 'irrespective of ethnicity, language

background, culture, gender, ability, social background, sexuality, or religion' (Ministry of Education 1990). Consequently, students with EAL are taught in 'mainstream' classrooms alongside their non-EAL peers, in an effort to ensure equality of provision. However, it was observed that the policy of the Ministry has led to challenges for bilingual students and their teachers alike underlined in almost every teachers report. Teachers argued that from the policy perspective, language is not seen as a barrier to achievement. Also Greek teachers pinpointed that the EAL is not taken into consideration as a new element and contributing factor in the class. These reports are also in line with the literature regarding refuge education, that also characterize such policies as having 'a very marginal and Cinderella-like status within the school system' (Leung 2001 ibid:33). In effect, while national policy guides schools to promote a culture of inclusion and respect within the curriculum, schools (and the local authorities which support them) have to interpret and implement national guidelines regarding EAL for themselves.

Moreover, Greece in the last 4 years has experienced a large increase in the number of refugees arriving to the country , most of whom wish to reach more prosperous countries and feeling trapped in the host country (fig1.). As a result of this substantial increase, the existing school teachers and administrators, strongly proclaimed with every means they had, that could not meet the needs of these children effectively. Although most of the students were incorporated in mainstream schools, the need to establish schools units and new foundations that could meet effectively the demands of this diverse student population was strongly protested.
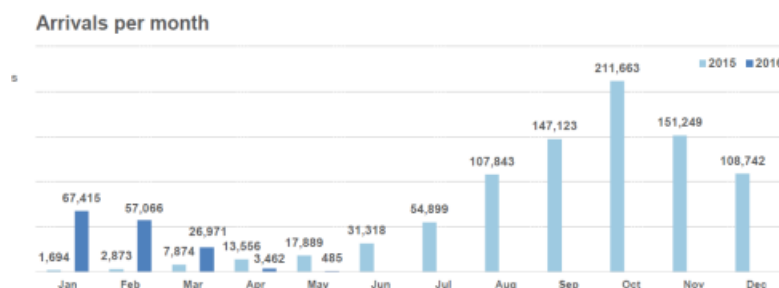
Fig1. Arrivals of refugees in Greek islands (2015-2016). Πηγή: UNHCR, "UNHCR Data portal, Greece-Greece data snapshot, 08 May 2016", 08.05.2016

The Greek ministry of education therefore, moved on to forming new educational forms, called DYEP, within the existing school units. In October 2016 the first 10 DYEP units were in operation and until May 2017 107 units were established. More than 145 DYEP exist now in Greece, both for secondary and primary education (FEK 38/ 4415/2016, A' 159, Ministry of education 2016), the distribution of the units are shown in the map below (fig2).
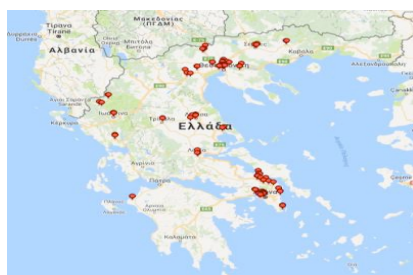
Fig2. Working DEYP units, Greece (March 2017). Ministry of Education

According to the law DYEP units, will operate after school hours, from 14.00 to 18.00 and for 20 hour per week. The schools that would operate as DYEP schools in the afternoon were selected based on their proximity to the refuge camps. The subject lessons that would be available were Greek Language (6 hours), English (4 hours), Math (3 hours) Physical education (3hours), IT (3 hours) Art (2hours). The ministry considered that within these units, refuge children would feel safe and, not only would be well prepared to join the mainstream schools after a year if they wished to stay in the host country, but also that they could be given adequate qualifications if they left the country.

Research Methodology

**2.1 DEYP Lexena: School context and Student background**

The project explored the school experiences of secondary-level students who speak EAL and the experiences, approaches and practices of their English Teachers. Taking a case-study approach, it focused on EAL speakers studying in DYEP Lexena, the only DYEP school in Peloponese, South West of Greece responsible for almost 250 students. The **background** of the students varied: A small percentage 5% came to Greece as permanent migrants with extended family networks; a considerable 90% came to the Greece for long periods but it was unclear as to whether they are 'permanent' migrants or not and have arrived as a result of forced migration or displacement, as refugees, asylum seekers, and whose status within Greece must be resolved. Furthermore, the **age** at which children arrived in Greece is also varied. A 40% was young children 7-11, while a 60% was 11-18 years old. Here, we must point that official records of exact age did not exist, for the majority of the students, in the school. Consequently the age groups were mostly formed according to the age the students or parents claimed. EAL students' ***proficiency in English*** also varied, while EAL speakers, by their very nature, speak at least one other language at home (usually the language of their parents' country of origin), some may speak only one other language and English, others were proficient in more than one language other than English, some also have learned the language of a previous host country, usually Turkish, before arriving in Greece. Furthermore, growing up in a multilingual home or community developed children's ability and willingness to switch between languages, a further attribute that they bring into the school environment (Anderson et al., 2016), although one which is often not readily recognized in Greek schools. Studies have shown(Gillborn, 1995, Anderson 2016) , that this varying level of language proficiency affects not only their ability to access the curriculum and reach their academic potential, but can also impede the social skills students must poses to operate in the school setting. Furthermore, students different in their *own-language literacy*, which posed, further with implications for their development of English language literacy. Meanwhile, differing parental proficiency in English and attitudes towards English *also* affected English language Teaching. Approximately equal numbers of boys and girls participated in the study. Efforts were also made to work with students drawn from a range of ages and countries, however the small sample size of the participants and their diverse language level and background, mean that the study's participants are illustrative rather than representative.

2.2 Research questions and design

The study approached a mixed-methods research design, which explored students' daily own perception of their English language experience and needs. Also the study explored their English teachers' perceptions of the students' needs, obstacles and priorities. Qualitative data was therefore collected through questionnaires filled by EAL students, interviews with teachers and the school principal, classroom observation and field notes. Moreover, visual methods were employed in the study. Pictures of the visual messages, written on the school premises and equipment (chairs. desks etc) by refuge and Greek students, who also used the same equipment in the morning classes were taken. These pictures revealed, a hidden dialogue within these two groups, which was of great interest. Moreover, the generation of these three kinds of data enabled an in depth analysis, and alleviated the impact of the limitations of interviews and the 'observer's paradox' during observation when any of these methods are conducted in isolation. The aim of the data collection was to focus on participant meanings and interpretations of school life and learning, where understanding of the needs and obstacles derive from the fieldwork and data (Dornyei, 2007: 131).

The following research questions informed the project:
1. What are the barriers and problems EAL students face in the English language class
2. To what extend the students feel free to express and develop their own identity
3. What are the implications for the English teachers in relation to the students' needs and demands.
4. What good practices should be employed for learning English to be more effective.

2.3 Data Collection

The researchers informed the school principal and received parental consent in order have students fill in   the questionnaires. This meant that, the researcher clearly explained the aims of the study to the principal in a personal meeting, who in his turn informed the parents and distributed the parental consent form. The principal received himself the parental consent forms signed by the parents or care takers.

Then, the school was visited for a period of 4 weeks. The first week the focus was in building trust among the researchers and the participants both teachers and students. Also, during the first week pictures of the school visual messages, both formally or informally placed, were taken after school hours to ensure that there will not be students' faces in any pictures. The second and third week involved data gathering and observation of English lessons given in all age groups.

2.4 Data analysis

The 3 sets of data were examined together and categorized to find similarities and contrasts of concerns within the participants (student to student, teacher to student, teacher to teacher, teacher to principal, visual analysis). However, we must recognize that our project examined only a specific refuge school in a specific context and caution is needed concerning how far our findings can be used and generalized.

Regarding the ethics of the study we must point that throughout the study, attention was paid to ethical issues and prior consent from the Ministry's of Education Ethic committee was taken. The committee examined and approved the methods and questions of the study. The study's aims and processes were explicitly outlined to the committee and anonymity of the subjects and confidentiality were of major concern and attention by the researchers.

3. Findings

Our study tried to find the answer to the key question "How can learning English in refuge schools be improved and how EAL students experience this language learning. Clearly as a case study the data is just a snapshot of these issues in this particular school context. However, there was a considerable consensus between participants, who raised several key issues that need to be worked upon.

First and foremost the issue that both teachers and students raised was, the fact that there is instability regarding the status of the students; will they stay in Greece. This issue frustrated both teachers and students and was a matter of great conflict and anxiety that kept coming up almost in every class. Moreover in DEYP school were appointed teachers with few teaching hours, meaning a very limited salary. As a result English teachers felt unsatisfied with the money they earned in relation to the work load they had to undertake in these challenging circumstances. Also issues of them moving to other mainstream schools made them, caused further frustration since their work would not have the continuity the teachers hoped for. Furthermore, issues of not adequate training of the English teachers to teach in such learning environments was also recurrent in every teacher researcher interview.

Administrative issues were also found since the laws had to be quickly designed to cater for the new needs that several unclear points, were causes of further frustration and conflict both among teachers but also among teachers and students.

A major in our opinion point that needs to be addressed is the lack of cooperation between the morning schools and the DEYP schools. The English teachers of the two schools did not meet and did not cooperate enough as to design their lessons and organize their material. This made the DEYP English teacher feel alone, but also made the children feel as outcast and inferiors since they did not even meet with the Greek students at school. As the analysis of visual however, revealed both refuge and Greek students felt the need of meeting and interacting. Both groups left messages ,usually of music and questions to be answered by the next group that would use the same equipment. Most commonly messages of "which football team you support" or "music you like" were scripted on the desks using English as a medium of communication. We must mention that hatred messages or insulting messages related mostly to religion, race, sexuality were found however there were only scarce.

The issues students most commonly raised were issues of "fitting in", and not understanding the new culture of teaching. An interesting point is, that most students felt happy and more confident in the English language class, since they could understand and participate more actively in the lesson. They suggested that they encountered very fewer even no language difficulties in their studies in English

language. Challenges of managing the classroom, giving clear instructions, and more generally making the curriculum understood was a central concern of the teachers and students. Finally, finding appropriate material and issues of not knowing the culture and cultural restrictions of the students were central concern of teachers too. Most teachers felt intimidated when students used their first language in class. While students considered this as a good strategy to reduce anxiety and boost self esteem.

4. Recommendations

The question how can an English teacher best prepare himself/herself to successfully teach EAL and refuge students is not easy to answer. Having highlighted the many difficulties facing refugee children and having experienced good classroom practices by the aforementioned English teachers we will briefly try to make some recommendations. First of all teachers must keep in mind that students bring with them specific education related experiences. As a result, refuge children may have gaps in their skills and knowledge drawing upon their disrupted schooling and not due to lack of skills or aptitude. Moreover, refuge children may be exposed to multiple language instruction through the course of their migration, resulting in language confusion and limited opportunities to master academic content. Careful attention is needed to identify educational needs as opposed to innate capacities for learning. A further point is to keep in mind that refuge students may be influenced by prior experiences of discrimination by the authorities, which may affect their relationships with the teachers or peers. Therefore of major concern of the teacher is to try and establish a calm, collaborative and safe environment for those children, although it may seem difficult. Teachers should first try to find the students' needs and language level. Then combing good practices from general ELT training and combine them with material easily accessible and downloadable from UNHR site UNESCO and British council site, that have uploaded material for every age groups. Then carefully design of their lessons should follow so as not to use material that may be considered offensive of have cultural obstacles. Being informed and learn more about the culture and ethics of your class can assist the teacher in feeling more confident when interacting with material and while trying to choose material to use in their classes. Create a community where the student feels secure and catered for in invaluable for effective learning to take place. Teachers found particularly interesting and helpful working on projects about immigrant students' culture that later presented in special designed events to students of the morning school and their parents. Such projects were welcome by the immigrant students who started feeling as part of the community, as well assisted them in forming bonds with the morning class students with whom they might be in the same school the next year. Also it triggered interest and offers of help from the local community and authorities. This in turn had many practical issues that the teachers had to deal with solved by volunteers. An enlightening experience for teachers was a visit to the refugee camp where the students were living. That visit organized by the principal gave teacher a bigger picture on what are the circumstances and standards of living of those children and showed the potential source of many behavioral issues that were present in the classes. Teachers were more aware and more encouraged to go back to working hard. They also found themselves feeling relieved, since due to the fact that most of them had little or no teaching experience in such schools, caused them a feeling of inadequacy and as result retreat. Teaching in such challenging school environments and working with students that have experienced traumatic experiences requires extensive and

ongoing training for the English Teachers as well as well-organized and systematic planning from the Ministry. Further investigation into these key questions is necessary, which, alongside with more research projects on such issues are also vital. Finding time for teachers and school EAL leads to talk to EAL students in their own institutions, in order to uncover their varied experiences and perspectives, the challenges faced and the ways in which EAL students from all backgrounds and of all proficiencies can lead to better results of teaching and ensure a smooth inclusion/transition of the immigrant students.

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Student Perspectives of Experiential Learning in a Technical Education Program

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Abstract
This paper discusses students' perspectives of the impact that hands-on experiential learning laboratories have on both technical understanding and soft skill development. The hands-on experiential learning laboratory exercises provided opportunities for teams of students to build assemblies outside the classroom on full-scale projects by applying knowledge first learned in class. These exercises have been designed to reinforce course comprehension by combining them with additional instructional delivery methods allowing students to "learn by doing." Each hands-on experiential exercise followed a lecture and incorporated concepts learned in class; these exercises included wood and steel stud framing, exterior systems, door and window flashing and installation, and concrete. A survey was conducted to determine student's perspectives on how these exercises impacted and reinforced both technical skills and soft skills, including an increased understanding of systems and assemblies and greater appreciation for trades, interpersonal relationships and increased confidence. The results of the student surveys are presented and discussed. This information may assist technical education programs that are interested in developing hand-on experiential laboratory exercises to prepare students for careers.

Keywords: Experiential Learning, Hands-On, Project-Based, Curricula, Construction Management

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Introduction

The core subjects in construction management are scheduling, estimating and contracts, which are typically delivered in a lecture format in standalone classes (Chinowskly, Braown, Szajnman, & Realph, 2006). "The traditional segmented, topic-based approach to construction management curricula clearly has been successful at facilitating the attainment of specialized skills and concepts such as quantity surveying, estimating, or scheduling. However, the world does not always present problems that are topic specific and solved in a non-holistic manner." (Montoya, Kelting, and Hauck, 2009, p. 66). These lecture style classes work well to deliver management theory (Pratt, 1998), but construction educators are charged with preparing students who can lead and manage the overall construction process, not just specific, stand-alone aspects (Davis and Cline, 2009). Students must "connect the dots" between classroom theory and practical application, which some universities accomplish through a single capstone course in the student's senior year to "integrate multiple, interdisciplinary skills and abilities." (Benhart, Cabral, Hummard, Metzinger, Morgan & Santon, 2017). In contrast, other universities have developed and integrated these capstone classes across the curriculum giving students additional opportunities to solve complex problems (Benhart et al., 2017).

Construction management education teaches both technical and soft skills. Technical skills, also known as hard skills, are subject-based competencies related to the context within which they are performed. These competencies are required to complete a specific task, process, or procedure, and can typically be measured by a tangible end result (Hendarman & Cantner, 2018). In construction education, a technical skill could be the completion of a project schedule using a work breakdown structure. Soft skills, alternatively, are more frequently related to skill development in social contexts (Cappelli & Won, 2013). There is no consensus on the definition of soft skills, but they can include communication, critical thinking, problem solving, teamwork, ethics, etc. (Mahasneh & Thabet, 2015). In a study completed by Mahasneh and Thabet (2019), communication skills, workplace thinking skills and workplace ethics skills were ranked highest in importance for construction school graduates.

Kolegraff, Kline and Kelting (2019) studied integrated laboratory style courses to determine the types of instructional delivery methods students perceived to be effective and preferred for student learning. Of the 14 delivery methods surveyed, 57% of students ranked hands-on building as the most effective delivery method; with 59% of students surveyed stating it was their preferred instructional delivery method. However, little information was provided on how students perceived the impact of hands-on building in relation to their soft and technical skill development.

This paper expands the earlier research by exploring students' perceptions of how these experiential activities impact their skill development – both for technical skills and soft skills – by first describing the development of hands-on building exercises and the integration and expansion of those exercises into two project-based laboratory courses. The paper then provides survey results from both courses to gain students' perspectives on how participation in these hands-on building exercises reinforced or developed both their technical and soft skills.

Methodology

A survey was developed to collect data and assess students' perceptions of experiential learning and its impact on skill development. A total of 16 questions were included in the survey, which was distributed in hard copy form to students at the end of the term. These anonymous surveys were conducted over two consecutive courses in six separate construction management classes. All surveys were anonymous, and the data received was input manually into a database for analysis.

The survey included four different types of questions: demographic information, skill development, instructional learning methods, and free response. Skill development is the focus of this paper, with additional demographic information presented. The demographic information included the course the student was taking, their gender, and if they had taken this survey before in another course.

Ten questions were asked about skill development. Three questions asked about soft skills exclusively, four questions asked about technical skills, and the remaining three questions combined both soft and technical skills. The questions included 5-point Likert scale responses, ranking their perception of the activity's impact on skill development, in the following order: strongly agree, agree, neutral, disagree, and strongly disagree. These rankings were coded to quantify perceptions, with a 5 being strongly agree and strongly disagree being a 1. Descriptive statistics are provided and discussed for the data collected.

Research Questions

The following research questions were generated for this study:
1.   How did students perceive the impact hands-on experiential exercises had on their soft skills?
2.   How did students perceive the impact hands-on experiential exercises had on their technical skills?
3.   How did students' perceive the impact hands-on experiential exercises had on their construction management education?

Course Formats

The course formats remained the same as the previous study conducted by Kolegraff, Kline and Kelting (2019). The hands-on building activities took place at certain points throughout the ten-week quarter and were designed to augment learning achieved by the students through reading assignments, lectures, in-class activities and discussions, and homework assignments. Each week, students attended class for 13 hours to learn different aspects of construction relevant to either residential or commercial construction. The hands-on building activities varied depending on the course – residential or commercial - and the activities for each course are described below.

Residential Construction Course

The class sizes ranged from 20 to 25 students. The students were divided into teams of four to six people for both in-class assignments leading towards the final project and for building activities. The classes met 13 hours per week for a ten-week quarter

and were taught in a laboratory space dedicated to homebuilding education, specifically focusing on new-home construction in a residential tract environment. The class combined estimating, scheduling, residential methods, and contracts into one project-based class, where students worked towards the feasibility and analysis of all aspects of a new residential tract community. The following teaching methods were used in the class: reading assignments, in class activities and discussion, lectures, student presentations, quizzes, exams, homework assignments, peer review, working in a team, final project, hands-on building, field trips, and guest lectures.

The faculty strived to immerse the students in all aspects of residential construction through lectures and interactive discussions, covering topics from land acquisition to building materials, and the warranty process. Students prepared for class through reading assignments, then faculty reinforced main concepts through interactive lecture and in-class discussions and all lecture material was posted electronically. Relevant industry trends were also discussed, as well as means and methods, so students received the necessary information to work towards the completion of their final project incrementally throughout the quarter. The class was structured into weekly topic areas to reinforce the sequencing of installed components on an actual project.

For two weeks each quarter, students transitioned from the classroom to a hands-on building project to apply and reinforce their knowledge. During week four, students worked in teams to set anchor bolts and frame the floors, walls and roof of a small wood structure. This week's building expanded on the knowledge gained from the previous weeks' lectures on foundation and wood framing activities, and students were required to put into practice what they learned. During week seven, students continued work and completed the structure by applying house wrap, installing windows and a door, installing roofing materials including roof felt, flashing, and asphalt shingles, and completing exterior wood siding and trim. Again, these activities required the application of knowledge learned from the previous weeks' assignments and in-class discussions on water management, doors and windows.

Guest lectures from different departments of homebuilding companies were brought in from industry to discuss various topics of the course, based on their experience. Students also went on one field trip per quarter to tour a residential jobsite and witness the progression of a project. Each of these strengthened the relationship between industry and student.

The final project was a series of assignments that were to be completed throughout the quarter and then compiled into a comprehensive final project. For this final project, the students completed work in teams and were tasked to develop a feasibility analysis for a developed property. This feasibility analysis included funding and acquisition and required students to present a recommendation to proceed with the project or provide reasons why the project may be too risky for investors.

Commercial Construction Course

The commercial class sizes ranged from 20 to 25 students. The students were divided into teams of three to four people for the duration of the class. As a team they worked on in-class activities, final project deliverables, and hands-on lab activities. Classes met 13 hours per week for a ten-week quarter and were taught in a laboratory space

dedicated to commercial education. The course focused on Type I and II construction means and methods, estimating, scheduling, and contracts. Similar to the residential class, this class worked through a commercial project for the duration of the quarter. The following teaching methods were used in the class: reading assignments, in class activities and discussion, lectures, student presentations, quizzes, exams, homework assignments, peer review, final project deliverables, hands-on building, field trips, and guest lectures.

As a project-based class, the faculty led and taught the class through exercises dealing with preconstruction, construction, and post-construction activities throughout the quarter. Prior to class, students were responsible for completing reading assignments and quizzes focusing on the means and methods of construction that tied in to the class discussions. As the quarter progressed, students worked through final project deliverables, including: unit cost and historical cost estimating, preconstruction sequencing, request for proposal delivery, site logistics, safety management, scopes of work, subcontracting, self-perform estimating, bid packaging, and project scheduling.

For two weeks each quarter, students transitioned from the classroom to a building project to apply and further their knowledge. During week five, students worked in teams to prepare the existing grade, complete concrete formwork, place rebar, pour a footing and slab on grade, build CMU walls, and set temporary shoring (Pro-Shore decking) for second level construction activities. This week's building expanded on the substructure and superstructure knowledge gained in previous weeks' lectures, in-class activities, and final project deliverables. During week eight, students continued work on the structure, and built pre-fab light gauge metal stud walls, installed the walls on first and second floors, installed OSHA compliant safety rails on second floor decks, installed exterior sheeting, applied waterproofing, installed a window and door frame, and applied an exterior façade system. Again, these activities required the application of knowledge learned from the previous weeks' assignments and discussions on commercial framing assemblies, exterior façades, and waterproofing.

Guest lectures from different commercial building companies were invited to discuss various topics of the course, based on their experience. Students also went on two field trips per quarter to tour a commercial jobsite, witness the progression of a project, and view the different elements introduced through in-class lectures and activities.

The final project was a series of deliverables that were completed throughout the quarter and then compiled into a comprehensive final project. For this final project, the students prepared a request for proposal in week three presenting and delivering a project estimate, preconstruction schedule, and a management staffing plan; in week ten they presented and turned in a final packet compiled of: project buyout, subcontracting, site logistics and phasing, and a complete project schedule.

Survey Results

Survey data was conducted over two quarters in six separate classes, with six different instructors providing course instruction. Overall, feedback was obtained from 124 surveys. From those surveys, 61 surveys were for the residential construction course, 62 for the commercial course, with 1 left blank. Sixteen respondents were female

with 105 reporting as male; the remaining 3 surveys did not include gender data. Due to the sequential nature of the courses, it was possible for students to complete the survey two quarters in a row for two different classes. Of the respondents, 11 took the survey in multiple courses (once in the residential course and then, again, in the commercial course). The survey items are listed below, with a discussion of the analysis of the results.

Survey results are presented below in Table 1, with the percentage of responses for each Likert-scale category listed as well as the mean response rating. Ratings with "values of 4 and 5 were considered positive, 3 neutral and 1 and 2 negative" (Olbina, 2008, p. 55).

Table 1

Technical Skill Assessed	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean Rating
Understanding of different building systems and components.	73%	22%	4%	1%	0%	4.65
Application of knowledge of the different systems.	67%	26%	6%	1%	0%	4.58
Understanding of how things are put together.	82%	12%	6%	0%	0%	4.77
Understanding the sequencing of activities for different construction project components.	74%	18%	7%	1%	0%	4.65

Students also agreed that experiential learning helped with the development of soft skills, with appreciation for different trades being the highest ranking (see Table 2).

Table 2

Soft Skill Assessed	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean Rating
Appreciation of the different trades that complete the work.	71%	23%	6%	0%	0%	4.65
Enhanced my relationships with my team and other students	61%	28%	10%	1%	0%	4.48
Developed a stronger relationship with my instructor	58%	33%	8%	1%	0%	4.48

Finally, three questions combined both soft and technical skill development (see Table 3). From this, 97% of students either agreed or strongly agreed that experiential learning activities were a valuable part of a construction management experience. The lowest ranked item from the survey, development of professional

workplace skills, falls into this category, with 81% of respondents agreeing that it helped with the development, with 3% disagreeing and 16% neutral.

Table 3

Combined Technical and Soft Skill Assessed	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean Rating
Greater confidence in my building abilities.	64%	27%	8%	1%	0%	4.55
Development of professional workplace skills	44%	37%	16%	3%	0%	4.21
Building is a valuable part of my construction management education.	82%	15%	3%	0%	0%	4.78

Discussion of Survey Results

Overall, students' perceptions of experiential learning activities on skill development were considered positive, with all activities receiving a mean rating over 4 (Olbina, 2008). Each of the different skill groups are analyzed below.

Technical Skills

Technical skills received mostly positive ratings across all four questions, with only 1% of respondents providing a negative rating for three of the four questions. The second highest mean score of 4.77 is present in this category, helping students understand how things are put together. In addition, students agreed that the experiential learning activities helped with their understanding of the different systems and components presented in class, could apply their knowledge, and helped with the understanding of activity sequencing. This information indicates that experiential learning helps students connect the dots between classroom activities and lecture to application in real world environments.

Soft Skills

Soft skills also received mostly positive rating across all three questions, again with 1% of respondents providing a negative rating for two of the three questions. Ninety-four percent of students agreed that the activities gave them an appreciation of the different trades that complete the work. However, the activities' impact on relationship building with both their team members and the instructor were slightly lower. Although still positive, both relationship questions reduced mean ratings of 4.48, the second lowest ratings across all questions.

Combined Soft and Technical Skills

This category yielded both the highest and lowest mean ratings for different responses. An overwhelming 97% of students agreed that building/experiential learning was a valuable part of their construction management education. However,

only 81% agreed that it helped with the development of professional skills. Upon further analysis, this response may be due to different interpretations by the students on the definition of professional skills; no definition was provided so this open interpretation could lead to varied results. Additionally, although 91% agreed that building gave them greater confidence in their building abilities, only 64% strongly agreed with this statement.

Table 4 combines the results from the exclusively technical skills questions and soft skills questions. Reviewing this indicates that the experiential learning environment aids with the development of both skill sets, but students perceive greater development of technical skills with these hands-on activities.

Table 4

Summary of Technical vs. Soft Skills	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean Rating
Technical skills only	74%	19%	6%	1%	0%	4.66
Soft skills only	63%	28%	8%	1%	0%	4.54

Conclusion

Previous studies indicated that students prefer hands-on experiential learning opportunities, and find them effective as an instructional delivery method (Kolegraff, Kline & Kelting, 2019). However, the study did not provide insights as to the types of skills developed by students through these activities. This study provided students' perceptions of both technical skills and soft skills as a result of hands-on activities incorporated into coursework.

The survey offered reviewed the perceptions of students of these activities. Overall, student perceptions of both technical and soft skill development were positive, with 93% agreeing that the activities enhanced their technical skill development and 91% agreeing they enhanced soft skill development. Additionally, an overwhelming 97% considered the activities a valuable part of their construction management education. These positive responses support the faculty's decision to incorporate hands-on experiential learning into each course.

Upon review of the data, several areas became apparent for future research. First, since students complete these activities in sequential courses, do responses differ from course to course. Additionally, is there a difference in technical and soft skill development by gender. Finally, follow-up surveys could be gathered to determine what specific activities led to positive and negative results.

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English Language Teaching Innovation from Learning Strategies of High-performing Students in a Government University in Ayutthaya

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Abstract
This study aims to (1) investigate students' English learning strategies; (2) analyze the learning strategies of high-performing students; (3) construct innovative lesson plans based on successful learners. The purposive samples are 35 students majoring in English for International Communication who enrolled in 22 English related subjects from Rajamangala University of Technology Suvarnabhumi. This study is a mixed methods research - quantitative and qualitative methods. The two instruments are (1) questionnaires and (2) focused group interview forms. The questionnaire consists of 50 items in 6 learning strategies: Memory, Cognitive, Compensation, Metacognitive, Affective and Social. Semi-structured interview was held for five high-performing students. The research methods are (1) the questionnaire was filled out by the samples; (2) five high-performing students were selected for the focused-group interview; and (3) the findings from the interview were utilized for constructing the lesson plans. The data were statistically analyzed with mean and standard deviation. The findings are as follows: (1) students' English learning strategies are Memory ($\bar{x}$ = 3.55), Cognitive ($\bar{x}$ = 3.86), Compensation ($\bar{x}$ = 3.71), Metacognitive ($\bar{x}$ = 4.28), Affective ($\bar{x}$ = 3.6) and Social ($\bar{x}$ = 3.79); (2) the learning strategies of high-performing students are memorizing new vocabulary as a picture and connecting it with context; building up new vocabulary and expressions by watching online game casting and joining social network sites like Tinder, Hello Talk, etc. (3) A lesson plan based on successful learners is Vlogging yourself, etc. The discussions of the findings are further discussed in detail.

Keywords: learning Strategy; high-performing students; English Teaching Innovation

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Introduction

English is considered as a medium of instruction in today's world. Being able to communicate in English can widen better opportunities in working and studying. English proficiency is also necessary for career promotion in the future both in economic, industrial and social aspects. These are essential for country development and manpower. English learning performance affects life advancement, thus English language policy is the ongoing universal practice.

Thailand requires all students to study English as compulsory subjects for at least 12 years from basic education to the level of higher education. As the rank showed that English proficiency of Thai students was becoming deteriorated and undesirable which resulted in the 3rd worst in Asia (James, 2015). Along with the latest 2019 report by the Education First (EF) English Proficiency Index, Thailand ranked 74th out of 100 (EF EPI, 2019) with a score of 47.61 ranking in "very low proficiency" (Educational First, 2019). It is clear that several learners are not able to perform well in using their English skills in everyday life.

There are plenty of factors affecting the English language learning; Learning strategy is one of them. Strategies are essential in learning a language as Griffiths (2007) defines language learning strategies as activities selected with learners' consciousness for the purpose of controlling their own language learning system. While Richards and Platt (1992) give an explanation that language learning strategies are used by the learners with their intentional behavior and thoughts for understanding, learning and remembering new information. These strategies play an important role in language learning performance in the fast changing digital era.

At present, learners' behaviors involve the use of technology and digital media. Apart from computers, smart phones and internet-accessible devices are increasing and become readily available for the English language teachers to shift from traditional to modern classrooms. Pourhosein Gilakjani (2013) stated that the use of these technologies has the great potential to change the existing language teaching methods. Moreover, according to Eady & Lockyer (2013), technology has always been an important part for teachers to facilitate learners' learning from the beginning of preparing learning experiences through to teaching and learning process. Bennett, Culp, Honey, Tally, and Spielvogel (2000) verified that the use of computer technology leads to the development of teachers' teaching and learners' learning in the classes.

From the essence of English language for both education and workforce to the integration of technological enhancement from language strategies focusing on learners' behavior, this paper mainly studies the learners' English language learning strategies with their use of modern technology materials.

Language Learning Strategies

Cohen (1998) stated, the term strategy, in the second language learning (SLL), has appeared in order to be applied to the conscious moves adopted by second language users determined to be useful in both learning and employing a second language. Oxford (1990 a, p. 209) and Wenden and Rubin (1987) also defined language learning

strategies as the particular thoughts or behaviors and tasks that learners apply to assist them to comprehend, learn, and retain new data. Strategies help learners in acquisition, storage, retrieval, and the retention of information to make learning easier, faster, more enjoyable, more self-directed, more efficient and more transferable to novel situations. A combination of learning strategies is a device used by good language learners for the self-directed involvement which is developing communicative ability (Oxford, 1990b). While Rubin (1975) suggested that successful learners use a strategic collection dependent on their own personality, style of learning, and their individual needs.

Stern (1975, 1983) came up with a list of ten strategies of good language learners, including planning strategy, active strategy, empathetic strategy, experimental strategy, formal strategy, semantic strategy, practice strategy, communication strategy, monitoring strategy and internalization strategy. While O'Malley et al (1985b)'s taxonomy identified 26 strategies divided into three categories: metacognitive, cognitive, and social and communication strategies. Moreover Ellis and Sinclair (1989: 151-154) have also classified strategies into four categories: metacognitive strategies, cognitive strategies, social strategies and communication strategies. It can be seen that communication strategy is widely used across all strategies because it encourages teachers and students to share ideas and experience.

This study, the language learning strategies are based on Oxford and Burry-Stock (1995). They have proposed the following classification of the language learning strategies applied by EFL/ESL learners:
1. Memory strategies: grouping, imagery, rhyming, and structured reveling
2. Cognitive strategies: reasoning, analyzing, summarizing, as well as general practicing.
3. Compensation strategies: guessing synonyms from the context in reading and listening, using synonyms and gestures to convey meaning when the precise expression is not known.
4. Metacognitive strategies: paying attention, consciously searching for practice opportunities, planning for language tasks, self-evaluation of one's progress, and monitoring errors.
5. Affective (emotional, motivation-related) strategies: anxiety reduction, self-encouragement, and self-reward.
6. Social strategies: asking questions, cooperating with native speakers of the language, and becoming culturally aware.

Innovation

Technology is the practical use of knowledge especially in a particular area and is a way of doing a task by using technical processes, methods, or knowledge. The usage of technology consisted of not only machines (computer hardware) and instruments, but also involves structured relations with other humans, machines, and the environment (İŞMAN, 2012). While Dockstader (2008) defined technology integration as the use of technology to improve the educational environment and promote the classroom teaching through creating opportunities for learners to finish assignments on the computer or mobile devices rather than the normal pencil and paper.

Objectives

This study aims to
1.   investigate students' English learning strategies;
2.   analyze the learning strategies of high-performing students;
3.   construct an innovative lesson plan based on successful learners.

Materials and Methods

Participants

The participants of the study were 35 bachelor's degree students who were purposely selected from the Faculty of Liberal Arts, majoring in English for International Communication at Rajamangala University of Technology Suvarnabhumi, Ayutthaya Campus, Thailand. The samples were currently in the fourth year and had already enrolled in 22 English related subjects taught by both Thai and foreign teachers.

Instruments

This study is a mixed methods research - quantitative and qualitative methods. The two employed instruments were as follows:

1. The adapted version of Strategy for Language Learning questionnaire (SILL, Oxford, 1990) was administered to investigate the participants' English language learning strategies. It consists of 50 items covering 6 learning strategies: Memory, Cognitive, Compensation, Metacognitive, Affective and Social. The participants were asked to respond to each statement on a five-point Likert scale. The answers ranged from '1 = never or almost never true of me' to '5 = always or almost always true of me.' The back-translation was performed into Thai language which is the respondents' mother-tongue. Language accuracy was performed by Three English language teachers, followed by the Item-Objective Congruence (IOC) to find the content validity which was done by three research experts.

2. Focused group interview form was created and designed based on the aforementioned questionnaire. To get more deep details and insights from the selected five high-performing students, one interview question was raised to be the representative of each strategy. The content validity check was done by three research experts to make sure all 6 interview questions can extract respondents' learning strategies.

Procedures

There were three phases. The first phase was qualitative research design which was employed through survey methodology. The adapted SILL questionnaire was distributed to 35 purposely selected students in the classroom and time was given. The data were statistically analyzed with mean and standard deviation. Then, the students' grades of 22 English related subjects were collected to divide learner categories. Out of 35 students, there were 5 students whose grades ranged from 3.54-3.95 fell into two types of honorary bachelors. The First honorary bachelor's GPA

must be equivalent to or more than 3.75 while the Second honorary bachelor must have at least 3.5 GPA (RUS Student Manual, 2019). The group of 5 high-performing students participated in a semi-structured interview using the focused group interview questions. Those questions selected from each of six strategies and follow-up questions used to get deep details of individual learning strategies. After that, the data were qualitatively transcribed. Finally, the findings from the interview were conducted to construct a sample lesson plan.

Findings

1. Students' English learning strategies

The summary of the use of learning strategies consists of memory, cognitive, compensation, metacognitive, affective and social. The top three frequently used were metacognitive ($\bar{x}$ = 4.2857 and SD = 0.7412); cognitive ($\bar{x}$ = 3.8653 and SD = 0.0.9155); and social ($\bar{x}$ = 3.7952 and SD = 0.9016). While the least frequently used strategy was Memory ($\bar{x}$ = 3.5555 and SD = 0.9909); as shown in Table 1.

Table 1: The summary of the use of learning strategies

No.	Strategies	Statistics			
		Mean	**SD**	**Level**	**Rank**
1.	Memory	3.5555	0.9909	high	6
2.	Cognitive	3.8653	0.9155	high	2
3.	Compensation	3.7190	1.0134	high	4
4.	Metacognitive	4.2857	0.7412	high	1
5.	Affective	3.6333	0.9337	high	5
6.	Social	3.7952	0.9016	high	3
	Overall SILL	**3.9159**	**0.8496**	**high**	

1.1 Memory strategies

The top three used memory strategies were 1) previous and new knowledge connection ($\bar{x}$ = 4.0286, SD = 0.7065); 2) making a mental picture for new words ($\bar{x}$ = 3.8000, SD = 0.8677); sound and image connection ($\bar{x}$ = 3.8000, SD = 0.9641); 3) words' original location ($\bar{x}$ = 3.8000, SD = 0.9641); and 4) word in a sentence context ($\bar{x}$ = 3.6286, SD = 0.9727). The least used strategy was flash cards at medium level ($\bar{x}$ = 3.0286, SD = 1.3824); as shown in Table 2.

Table 2: Memory strategies

No.	Memory Strategies	Statistics			
		Mean	**SD**	**Level**	**Rank**
1.	I think of relationships between what I already know and new things I learn in English.	4.0286	0.7065	highest	1
2.	I use new English words in a sentence so I can remember them.	3.6286	0.9727	high	3
3.	I connect the sound of a new English word and an image or picture of the word to help remember the word.	3.8000	0.9641	high	2

4. I remember a new English word by making a mental picture of a situation in which the word might be used.	3.8000	0.8677	high	2
5. I use rhymes to remember new English words.	3.4857	0.9194	medium	4
6. I use flashcards to remember new English words.	3.0286	1.3824	medium	7
7. I physically act out new English words.	3.2857	1.2964	medium	5
8. I review English lessons often.	3.1429	0.8452	medium	6
9. I remember new English words or phrases by remembering their location on the page, on the board, or on a street sign.	3.8000	0.9641	high	2
Total	**3.5555**	**0.9909**	**high**	

1.2 Cognitive Strategies

The top three used cognitive strategies were 1) pronunciation practice ($\bar{x}$ = 4.2857, SD = 0.7504); 2) watching TV or movies ($\bar{x}$ = 4.2286, SD = 1.0596); and 3) impersonating native English speakers ($\bar{x}$ = 4.1143, SD = 0.9000); While the least used strategy was writing notes, messages, letters, or reports ($\bar{x}$ = 3.0286, SD = 0.9231); as shown in Table 3.

Table 3: Cognitive strategies

No.	Cognitive Strategies	Statistics			
		Mean	SD	Level	Rank
10.	I say or write new English words several times.	3.8286	0.9544	high	9
11.	I try to talk like native English speakers.	4.1143	0.9000	high	3
12.	I practice the sounds of English.	4.2857	0.7504	high	1
13.	I use the English words I know in different ways.	4.0857	0.6585	high	4
14.	I start conversations in English.	4.0571	0.8023	high	5
15.	I watch English language TV shows spoken in English or go to movies spoken in English.	4.2286	1.0596	high	2
16.	I read for pleasure in English.	3.4857	1.0675	medium	12
17.	I write notes, messages, letters, or reports in English.	3.0286	0.9231	medium	13
18.	I first skim an English passage (read over the passage quickly) then go back and read carefully.	4.0286	0.9231	high	6
19.	I look for words in my own language that are similar to new words in English.	3.7714	1.1137	high	10
20.	I try to find patterns in English.	3.7714	0.8432	high	10
21.	I find the meaning of an English word by dividing it into parts that I understand.	3.9429	0.9375	high	7
22.	I try not to translate word-for-word.	3.8571	0.9121	high	8
23.	I make summaries of information that I hear or read in English.	3.6286	0.9727	high	11

Total	**3.8653**	**0.9155**	**high**	

1.3 Compensation Strategies

The top three used compensation strategies were 1) gestures ($\bar{x}$ = 4.4286, SD = 0.7778); 2) guessing ($\bar{x}$ = 4.3143, SD = 0.7581); and 3) using synonyms ($\bar{x}$ = 4.1429, SD = 0.9121). While the least used strategy was avoiding using a dictionary ($\bar{x}$ = 2.7429, SD = 1.1464); as shown in Table 4.

Table 4: Compensation strategies

No.	Compensation Strategies	Statistics			
		Mean	**SD**	**Level**	**Rank**
24.	To understand unfamiliar English words, I make guesses.	4.3143	0.7581	high	2
25.	When I can' t think of a word during a conversation in English, I use gestures.	4.4286	0.7778	high	1
26.	I make up new words if I do not know the right ones in English.	3.1714	1.3391	medium	5
27.	I read English without looking up every new word.	2.7429	1.1464	medium	6
28.	I try to guess what the other person will say next in English.	3.5143	1.1472	high	4

No.	Compensation Strategies	Statistics			
		Mean	**SD**	**Level**	**Rank**
29.	If I can' t think of an English word, I use a word or phrase that means the same thing.	4.1429	0.9121	high	3
	Total	**3.7190**	**1.0134**	**high**	

1.4 Metacognitive Strategies

The top three used metacognitive strategies were 1) self-improvement ($\bar{x}$ = 4.7143, SD = 0.5725); 2) paying attention to the speaker ($\bar{x}$ = 4.6000, SD = 0.6039); and 3) learning from mistakes ($\bar{x}$ = 4.5714, SD = 0.6081). While the least used strategy was planning study schedules ($\bar{x}$ = 3.6571, SD = 0.9684); as shown in Table 5.

Table 5: Metacognitive strategies

No.	Metacognitive Strategies	Statistics			
		Mean	**SD**	**Level**	**Rank**
30.	I try to find as many ways as I can to use my English.	4.1429	0.7724	high	6
31.	I notice my English mistakes and use that information to help me do better.	4.5714	0.6081	highest	3
32.	I pay attention when someone is speaking English.	4.6000	0.6039	highest	2
33.	I try to find out how to be a better learner of English.	4.7143	0.5725	highest	1
34.	I plan my schedule so I will have enough time to study English.	3.6571	0.9684	high	9

		Mean	SD	Level	Rank
35.	I look for people I can talk to in English.	4.0286	0.8220	high	7
36.	I look for opportunities to read as much as possible in English.	3.9714	0.8907	high	8
37.	I have clear goals for improving my English skills.	4.3714	0.7311	high	5
38.	I think about my progress in learning English.	4.5143	0.7017	highest	4
	Total	**4.2857**	**0.7412**	**high**	

1.5 Affective Strategies

The top three used affective strategies were 1) relaxing when being afraid ($\bar{x} = 4.6571$, SD = 0.5392); 2) being total patient in speaking practice ($\bar{x} = 4.4571$, SD = 0.6572); and 3) expressing feelings ($\bar{x} = 3.8286$, SD = 0.9544). While the least used strategy was writing a feeling diary ($\bar{x} = 2.2000$, SD = 1.2788); as shown in Table 6.

Table 6: Affective strategies

No.	Affective Strategies	Statistics			
		Mean	SD	Level	Rank
39.	I try to relax whenever I feel afraid of using English.	4.6571	0.5392	highest	1
40.	I encourage myself to speak English even when I am afraid of making a mistake.	4.4571	0.6572	high	2
41.	I give myself a reward or treat when I do well in English.	3.6000	0.9139	high	4
42.	I notice if I am tense or nervous when I am studying or using English.	3.0571	1.2589	medium	5
43.	I write down my feelings in a language learning diary.	2.2000	1.2788	low	6
44.	I talk to someone else about how I feel when I am learning English.	3.8286	0.9544	medium	3
	Total	**3.6333**	**0.9337**	**high**	

1.6 Social Strategies

The top three used social strategies were 1) asking the speaker to slow down ($\bar{x} = 4.7143$, SD = 0.4583); 2) learning culture ($\bar{x} = 4.2000$, SD = 0.9641); and 3) asking questions ($\bar{x} = 3.7429$, SD = 0.9500). While the least used strategy was asking a native for help ($\bar{x} = 3.1429$, SD = 0.9121); as shown in Table 7.

Table 7: Social strategies

No.	Social Strategies	Statistics			
		Mean	SD	Level	Rank
45.	If I do not understand something in English, I ask the other person to slow down or say it again.	4.7143	0.4583	highest	1
46.	I ask English speakers to correct me when I talk.	3.4000	1.2414	medium	5
47.	I practice English with other students.	3.5714	0.8840	high	4
48.	I ask for help from English speakers.	3.1429	0.9121	medium	6

49.	I ask questions in English.	3.7429	0.9500	high	3
50.	I try to learn about the culture of English speakers.	4.2000	0.9641	high	2
	Total	**3.7952**	**0.9016**	**high**	

2. Learning strategies of high-performing students

The use of learning strategies is from the top five high-performing students answering six questions. They represent learning strategies: memory, cognitive, compensation, metacognitive, affective and social. The details are as follows:

2.1 Strategy 1: Memory

Table 8: Memory Strategies

Strategy: How do you remember English vocabulary, expressions and new structures from inside and outside the classroom?

Details: • Use multimedia: songs, VDO clips, TV series, movies
    • Watch vlog from both native & non-native speakers
    • Make use of Google Translation and mobile phone
    • Form sentences in their heads
    • Memorize new word as a picture
    • Imagine a situation that fits the new word

2.2 Strategy 2: Cognitive

Table 9: Cognitive Strategies

Strategy: Which media do you use to help practice English listening, speaking, reading and writing skills?

Details: • Watch series, movies, online game casting, vlog and interview on YouTube
    • Listen to music then look for lyrics to study about grammar and vocabulary
    • Find new foreign friends via *Hello Talk* and *Tinder*, the applications that help you to match the one with the same interests and also allow both interlocutors to fix language problems such as grammar, spelling and so on.

2.3 Strategy 3: Compensation Strategy

Table 10: Compensation Strategies

Strategy: How did you find a way out if you were unable to recognize the words during communication in both face-to-face and online chatting,

Details: • Open online dictionaries
    • Use synonyms or say it indirectly
    • Provide examples
    • Give more detailed explanation
    • Use hand gestures and body language

2.4 Strategy 4: Metacognitive Strategy

Table 11: Metacognitive Strategies

Strategy: What is your goal in learning and using English?
Details: • Travel around the world • Talk to foreigners to exchange cultural knowledge • Be an office worker, writer, translator, teacher and well-known tutor • Teach hill tribe children on the mountains

2.5 Strategy 5: Affective Strategy

Table 12: Affective Strategies

Strategy: How do you handle the situation when facing obstacles during learning English and feel discouraged?
Details: • Stop what you are doing, come back again later • Exercise, sleep, and talk to friends • Find something fun to watch on TV • Listen to easy listening, sad, and EDM songs; sing karaoke

2.6 Strategy 6: Social Strategy

Table 13: Social Strategies

Strategy: How do friends and people around you influence the way you learn English?
Details: • The teachers during their first year. • Foreign teachers teaching in English. • A lot of chances to practice listening and speaking given by teachers • Thai teachers should teach English in English. • Teachers give comments right after student role play or presentation.

3. An innovative lesson plan

Lesson plan was created with objectives, contents, activities, assessment and measurement as follows:
Topic: Vlogging yourself
Lesson objectives: Students will be able to tell their routine via a video clip that uploaded onto YouTube
Language function: introduce oneself and story-telling
Resources: mobile applications - Hello Talk, Tinder, YouTube, Facebook; movies; songs; games, etc.
Assessment: Speaking rubric
Skills: Speaking - story-telling, introducing oneself, and expressing feelings
Duration: 3 hours

Conclusion and Discussions

According to the summary of the use of learning strategies, it was found out that the most used strategy was metacognitive strategies which are used for plan, organize,

focus and monitor learning, followed by cognitive strategies which are used for comprehension and production. In the details, it showed that the top three used metacognitive strategies were 1) being a better language learner; 2) paying attention to the speaker; and 3) learning from the mistakes; while in the cognitive, the respondents chose to practice pronunciation, watch TV or movies and impersonate native English speakers. These findings of this study correspond to Brown, Bransford, Ferrara and Campione (1983) who conducted a research on non-L2 and found out that to create an effective language learning, learners often used metacognitive strategies such as organizing, evaluating, and designing their learning; incorporating with cognitive strategies such as analyzing, reasoning, transferring information, taking notes, and summarizing. Finally, Oxford (1990b, 1999) claimed that proper learning strategy applications adopted by language learners make learning effortless, quicker, more enjoyable, more self-directed, more effective, and more transferable to new situations can lead to second language proficiency.

The data pointed out that the technology from student strategies focused on social media added in classroom activities. Most of them prefer to use online applications and websites to help find their needed information and interact between target groups of people. All of the strategies and technology implementation contribute to the language learning process. Further than this, the innovative lesson plans affect and respond to the students' needs. It is an alternative way for teachers and students in the language classrooms including educators and curriculum planners, in order to frame the language learning policy by the integration of strategies and technology.

Acknowledgement

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