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Sculpture Walks: Mobile Technology and The Aesthetic Experience

Mei-Ling Audrey Tan, Ministry of Education, Singapore
Paul Lincoln, National Institute of Education, Singapore

The Asian Conference on Technology in the Classroom 2015
Official Conference Proceedings

Abstract

This paper looks at how the use of mobile technology can aid in the aesthetic experiences of sculptures for students. Based on external scans, there are currently existing solutions of interactive learning trails used by other schools and enrichment groups in Singapore. However, although the feedback from these trails for student engagement was positive, the cost to engage vendors to run these trails was very high. A team of teachers from Beatty Secondary School therefore sat down to design a mobile art trail application or ‘app’ for short to tap on 21st century attributes and various theoretical frameworks.

Using the learning package and mobile application, a qualitative study was conducted and interviews were held for both students and teachers who went through the sculpture walk. The results were then triangulated with the researcher’s own observation to form conclusions.

It was discovered that the choice of activity can help to determine if students notice sculptures better and/or gain a greater aesthetic experience of the sculpture. Also, it appears that technology does facilitate learning through funneling the experiences through the mobile app, but it can also impede the aesthetic experiences of the student. These findings impact curriculum planning and the role of the art teacher as a blended approach of out-of-classroom, mobile technology and face-to-face learning appear to better cater to the learning needs of students viewing sculpture than just using the mobile app on its own.

Keywords: mobile app, mobile technology, art, sculpture walks, aesthetic experience

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Introduction

As schools become increasingly open to technology and community resources, the teacher's realm of influence reaches beyond the classroom. While it is critical to understand how the teacher's teaching, practices and knowledge impact student's learning in the art classroom, it is also important to investigate the influence of these factors on student's learning in out-of-school settings. Combined with the use of technology, works of Art and by extension sculpture, need to gather new insights to engage students in a critical, communicative and expressive manner.

This research looks into a few areas:

- a) the use of technology in understanding sculpture and how the aesthetic experience of the student might improve when they go through a blended learning activity using mobile technology
- b) the authenticity of the aesthetic experience in relation to emotions
- c) that viewers presence on site at the sculpture is essential in order to appreciate its sculptural form
- d) the notion that mobile technology can be used to heighten the attention to perception and thus the aesthetic experience of the sculpture

This study therefore tries to find out whether the use of mobile technology does help to support the aesthetic experience through students' opinions, teachers' observations and the overall experiences of the learning journey.

Literature Review

In today's society, youth spend a large amount of time on new media as seen by the proliferation of media texts found on Facebook, Instagram, Twitter and YouTube (Rideout, Roberts, & Foehr, 2005). In recent years, schools have been increasingly committed to educating students with diverse learning needs. Although learning has moved out of the classrooms, many educators are still highly dependent on pen and paper techniques. This limits the opportunities to connect to the various interests of youths and does not harness the wave of technology-what is needed "is a way for current curriculum objectives to connect to the youth culture and actively engage them in learning while preparing youth with critical 21st-century learning skills that extend beyond traditional types of literacy" (Peppler, 2010, p. 2119).

In Singapore, educators believe that ICT, and by extension mobile technology, can empower teachers and learners, transforming teaching and learning processes from a highly teacher-dominated to that of student-centeredness (CCD, 2008). This change will then allow for opportunities for learners to develop their creativity, critical thinking skills, problem-solving abilities, communication skills and other higher-order essential skills and competencies. This is supported by Jonassen, Peck and Wilson's (1999) constructivist approach towards learning whereby when students utilise technologies in a constructivist manner towards the implementation of mobile technologies. This allows students to work independently while the teacher's main role is that of a facilitator. The task of the teacher therefore is to translate information that will be learnt into a format appropriate to the student's current state of understanding. The students role then, is to explore and experiment in real world

situations instead of being told how to do something and through that process learn more (Craig & Van Lom, 2009). Constructivist learning theory therefore allows the individual to place value on the mobile technology rather than having the mobile technology imposing its worth on the individual. This principle thus helps to develop mobile technology into a hybrid model for integration in the educational setting.

Aside from the constructivist approach, other theories have also been used to support mobile technology in learning. The situated learning theory posits that learning is not merely the acquisition of knowledge by individuals, but rather a process of social participation (Brown et. al, 1989). Mobile technologies are therefore well suited in this instance as they are available in different contexts and can draw on those contexts to enhance a learning activity. Many museums and galleries have used these context-aware mobile computing capabilities by providing additional information about their displays and exhibits based on the visitor's location within them.

This emphasis on learner independence can be captured by Malcolm Knowles, a writer in the field of andragogy, who came up with a theory of self-directed learning (SDL). Knowles holds strong beliefs that students should be self-directed learners and teachers should be seen as facilitators of learning. He defined self-directed learning as that by which "individuals take the initiative, with or without the assistance of others, in diagnosing their learning needs, formulating learning goals, identify human and material resources for learning, choosing and implement appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, p.18).

Background of Mobile Art App

The characteristics of MOE's 21st century classroom pose a huge challenge for the teachers as designers of instructional programmes and learning resources. There is a larger emphasis towards students' autonomy in the learning process and as such the role of the teacher has shifted towards facilitating in an increasingly dynamic and fluid learning space (Tan & So, 2012). The functional purpose of the teacher therefore would be "to allow an unstructured space within the structured learning environment, whereby learners have the liberty to exercise judgment, set new learning intent and pursue new inquiries / interest areas" (Tan, So & Zhang, 2012, p. 707).

Previously, the school where this study is based on, embarked on sculpture walk Art Trails that were conducted by the Singapore History Consultants and endorsed by the National Arts Council. However, the teachers had observed that there was a low level of student engagement as the art trail made use of pen and paper worksheets. The efficacy of this mode of assessment of learning was not effective with less motivated students. The mode of learning was also mainly instructor centred with a large class size of 40 students. It was thus difficult for students to learn at their own pace, ask questions and participate actively.

A professional learning circle team (PLC) was therefore set up in the school to study this problem. Based on external scans, the team found existing solutions of interactive learning trails used by other groups in the school, such as the humanities department. However, although the feedback for these trails for student engagement was positive, the cost to engage vendors to run these trails was very high.

The team therefore set down to brainstorm and design a mobile art trail to tap on MOE’s 21st century attributes and the various theoretical frameworks like self-directed learning and collaborative skills. Combining some of the ideas from our research, the team worked at producing an app with features of guiding (museum apps), a little ‘treasure-hunting’ to find the site (waymarking) as well as activities and tasks that participants are required to do on site (geocaching). Students using the mobile art app navigate the various sites on their own in order to gather information as well as experiment with the iPad tools to fulfil the tasks (Figure 1 – 6). In addition, as the students are required to work in a group of four, the individual learner’s interaction and collaboration with fellow group members would then form a critical part towards the learning.

Figure 1: Home Page of Mobile App (Student’s Interface)

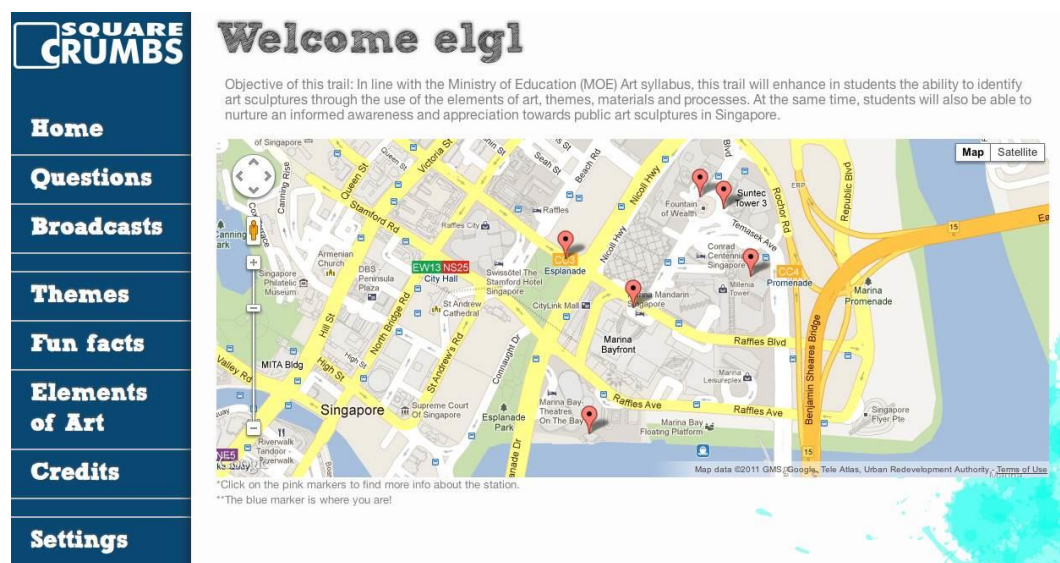


Figure 2: Activity Page for Sculpture Site

Seed Series Activity
 Artist: Han Sai Por
 Theme: **Nature**
 Location: **Outside the Esplanade**
 This piece of art shows a reflection of nature from the beginning stage in the form of *seed*.

"A sculpture is not a cold piece of stone, clay or metal. It has a life of its own. It's the sculptor's way of expression and it's his companion" - Lim, Richard (1998).

Activity: Take a photograph that best represent the whole seed series.
 Use the Photobooth app that can be accessed from the main screen.




Theme Fun facts Elements of Art Artist

23 students have not answered this question
 user1 , user2 , user3 , user4 , user5 , user6 , e1g5 , e1g6 , e1g7 , e1g8 , e1g9 , e2g3 , e2g6 , e2g8 , e2g9 , e2g10 , e3g3 , e3g4 , e3g7 , e3g10 , e4g2 , e4g3 and e4g6

51.1 %

Figure 3: Question Page for Sculpture Site

SQUARE CRUMBS

Home
Questions
Broadcasts
Themes
Fun facts
Elements of Art
Credits
Settings

Identify the element of art found in this piece of work (D – Describe the EOA)
Where do you think the artist has drawn his inspirations from? (I – Interpret the intention of the art work)

Theme Fun facts Elements of Art

Shape , line , form , color, texture and space.
He got his inspiration from a bacon strip.

Update answer Take Photo... Next >

1 person likes this answer.
Last updated 9:39 am
19 points

Feedback

PRIVATE SPACE BETWEEN THE TEACHERS AND STUDENTS

Post

Miss Audrey 25 Oct 2011, 9:11 am
Why bacon strip?!

Miss J
Not bac

Figure 4: Feedback and Scoring

e1g1 25 Oct 2011, 9:39 am 19 points • 1 person likes this

“ Shape , line , form , color, texture and space. He got his inspiration from a bacon strip.

» Like • Send feedback / comments • 10 3 points Update Score

e1g4 11 Nov 2011, 7:15 am 19 points • 1 person likes this

“ The element of art is form and the artist got his inspiration from space

» Unlike • Send feedback / comments • 10 4 points Update Score

e1g3 25 Oct 2011, 9:39 am 18 points

“ The form of this piece of art is sphere. The color is primary color. Texture is smooth.

Figure 5: Home Page of Mobile App (Teacher’s Interface)

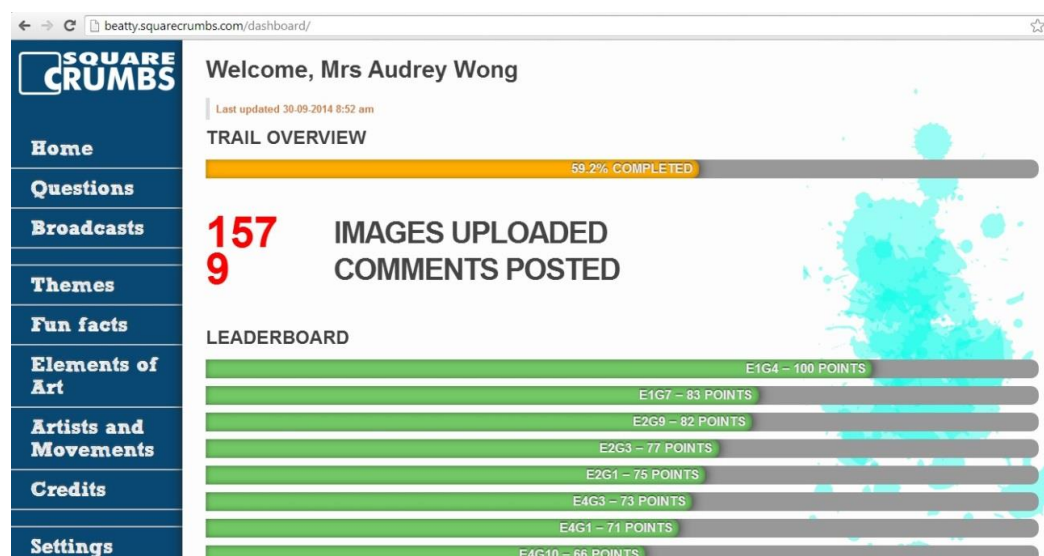


Figure 6: Questions Page of Teacher’s Interface



In line with the Ministry of Education (MOE) Art syllabus, the mobile art trail therefore was designed to help students’ find meaning in the art sculptures through the use of the elements of art, themes, materials and processes. As the teachers’ recognised the importance of viewing sculptures on-site, the hope was that the aesthetic experience gathered by the students would help them to renegotiate the relationship between the sculpture piece, the place and themselves. Students would also be able to nurture an informed awareness and appreciation towards public art sculptures in Singapore.

Research Methodology

The research was qualitative and was done using in-depth analysis of interviews from students who went for the walk and teachers who were at the different sculptures as well as the researcher’s field notes. The entire research consisted of three stages: the preparation stage, the data collection stage and the data analysis and evaluation stage.

Preparation Stage

Broad based open-ended interview questions were developed for this qualitative study so that it was flexible enough to enable respondents' feelings and attitudes to surface.

A total of 16 Secondary One students in a school in Singapore participated in this study. Four secondary one express classes were selected with each class having approximately 40 students. The ratio of boys to girls in these classes were almost equal. Four students (10% of the cohort) 2 boys and 2 girls, were selected at random as well as 2 art teachers. Selected respondents were briefed prior to the sculpture walk on the upcoming interviews that will be conducted after the walk. Students and teachers were then given the autonomy to decide the day and time that they preferred to have the interviews on. There was in-principle agreement from the school, staff and selected students in mid-October prior to ethics clearance in November. A couple of weeks prior to the interviews, students were required to fill up and submit the parental and individual consent forms while the teachers had to fill up the adult consent form.

Data Collection Stage

At this stage, a pilot interview session was carried out which consisted of three participants to test its feasibility. The participants had done the sculpture walk about two years prior to the writing of this paper. Based on feedback, the interview questions were tweaked to have greater clarity in terms of the type of questions asked.

The main interviews were then conducted in groups of 4 with each group of students belonging to the same class. The interviews for both students and teachers were collected within a few weeks after the sculpture walk and not on the day itself due to time constraints. Although 16 students were selected, only 14 students made it to the interviews while the remaining two chose not to participate due to personal reasons. It was observed that the participants in this study were fairly heterogeneous as students came from different racial as well as cultural backgrounds. Each interview session was done in a quiet, air-conditioned room and took approximately 15-20 minutes to complete. Participants were assured of their confidentiality prior to the start of the interviews and given the option to leave the interview sessions should they feel uncomfortable with no penalty or loss. The interviews were all audio-recorded and then transcribed for analysis.

Student interviews were structured loosely with the following set of questions:

- Have you seen the following sculptures prior to the sculpture walk?
- Can you describe your first impressions or feelings when you arrived at the designated sculpture before you did the e-activity?
- Describe how you feel participating in the e-activities
- Describe your feeling or impression of the sculpture after you carried out the e-activity.
- Did you have a favourite sculpture?
- Did the presence of the teacher at each sculpture help in your understanding of the sculpture?
- Would the experience of the sculpture walk be the same for you if it was done online via e-learning instead?
- What were your feelings at the end of the sculpture walk?

The data collected from students were responsive and emergent in nature and largely used to validate whether the use of mobile technology helped in reaching an aesthetic experience. The interviews from the students were used to triangulate with the art teachers as well as the observations done during the sculpture walk so as to provide the study with multiple sources of evidence for the theoretical propositions. Validity of the results was addressed as responses from both students' and teachers' interviews were checked against each other and later with the researcher's notes.

The teacher interviews were conducted individually in November. Questions for the teachers include the following:

- From your observations, what were the students' reactions like when they approach the sculpture?
- Did you notice if the students used any prior knowledge or experiences when viewing the sculpture? If yes, what and how did they do that?
- Do you think the experience of the sculpture walk would be the same for the students if it was done online via e-learning?
- How do you think the students can apply / have applied their learning from this sculpture walk in their art making?

Other qualitative data included the researcher's field notes which was captured in a notebook at the end of the mobile trail. These notes were collected based on the researcher's observation in three areas: how the mobile technology was used, the effectiveness of each activity during the sculpture walk and the students' reactions when they first approached the sculptures. Approximately 15 minutes was spent at each sculpture site to observe both students and teachers behaviours and conversations.

Data analysis and evaluation stage

The analysis of the interviews involved transcribing the audio-recordings into written text and then coding the interviews. Each transcript was read and re-read for the researcher to develop a sense of the data. The data was analysed both using the above questions as a guide as well as identifying themes that emerged from the transcripts. The following questions were used to suss out the themes:

- What did the students do at each sculpture site? How did they react to the sculpture?
- How were they using the mobile app and was the app easy to navigate?
- How did the students talk and do they understand what was going on? Did their past experiences relate to their behaviour and attitudes?
- What did the researcher see when the students were doing the activities?
- Were the patterns that emerge similar across the different classes?

The documented codes were then analysed for patterns and relationships before being collapsed to create categories. These were then further combined to create some overarching themes like technology in learning, advantages and disadvantages of mobile technology and the aesthetic experience when using the mobile app. The themes were then looked at to see how they support the theoretical perspectives and the understanding of the data sets. The responses were then triangulated against the researcher's own observations before some conclusions were drawn.

Limitations of Study

The sample of 14 students from four Sec One Express class were selected to represent a cohort of 160 students involved in the sculpture walk. It is assumed that the views and perceptions of students from the sample is representative of the entire cohort and generalizations can be drawn from the students' and teachers' interviews at the end of the sculpture walk. In addition, as the interviews were not done immediately after the sculpture walk, the memories of the students might have faded over time. Therefore the responses may have emerged in a different way if the interviews were done on the day, straightaway after the walk.

From the researcher's notes, it was noticed that the two students from Korea appeared to have gained more insights in this learning journey and were able to express their views regarding the sculptures due to previous exposure to art works in their own country. Future studies therefore might want to look at how the different racial and cultural backgrounds might have played a part towards how students experience the sculptures.

Research Findings

Although connectivity does open the door to limitless possibilities for interaction, it was fairly clear that the right choice of activity helped to encourage a greater aesthetic experience and appreciation of the sculptures. From the way the app was constructed, the six stations had six different facets and provided six different experiences. Sculptures and activities which allowed room for students to utilize their various senses – sight & touch predominantly resulted in a greater aesthetic experience.

In addition to the activities done, the questions that relate to each sculpture forces the students to view and think about the sculptures not only by itself but in relation to particular themes and the larger community. As a result, students appear to better integrate their understanding of the sculpture and its purpose *“Also about the way they ask, we can understand more about the sculpture itself...we had to use creativity to think about it, to see what is the...from our point of view what do you think is the purpose of this artwork.”* Here, the students generally agree that the iPad ‘forces’ them to see *“the piece more carefully when we answer those questions and realize more stuff”* as well as they having to *“concentrate more on the iPad”* versus the use of a pen and paper (Table 1).

Table 1: Description and Samples of Student Comments

Questions	Representative Student Comments	Researcher's Inference/Notes
Have you seen the following sculptures prior to the sculpture walk?	<p><i>"I've seen the Fountain of Wealth and the Seed Series before"</i></p> <p><i>"Fountain of Wealth and the Esplanade"</i></p>	Students mostly cited sculptures that serve dual functions of being an artwork and a tourist attraction.
Can you describe your first impressions or feelings when you arrived at the designated sculpture before you did the e-activity?	<p><i>"It felt majestic" (of the Fountain of Wealth)</i></p> <p><i>"...I feel that it was huge...so big that I can't take it..." (of the Fountain of Wealth)</i></p> <p><i>"I just thought 'Oh my God!'.... Because it is very big" (of the Six Brushstrokes)</i></p> <p><i>"Ginormous....because when, when you do a brushstroke on an ordinary paper, it is like so small. But then when you look at the six brushstrokes, it is like super gigantic." (of the Six Brushstrokes)</i></p>	The few comments made by students mostly reflected the size and impact of the sculptures. The feelings generated tend to be of surprise, amazement and awe.
Describe how you felt when participating in the e-activities.	<p><i>"The first one was a killer! ...The puzzles..."</i></p> <p><i>"I didn't really enjoy it...I just wanted to enjoy the scenery, I did not feel like completing the activity"</i></p> <p><i>"It was hard, hard to upload the photos"</i></p> <p><i>"It felt a bit like frustrating because some of our friends like, like very difficult to communicate, so..."</i></p>	The activities were reflected as difficult and time-consuming, taking away the enjoyment of the sculpture. Students also complained of technical issues and the instability of the network.
Describe your feeling or impression of the sculpture after you carried out the e-	<p><i>"After reading the fun facts....cos like the artist...you understand how the artist get the inspiration from, and then like what it's made of..."</i></p> <p><i>"The Fountain of Wealth gave you different perspectives (of the activity)...I didn't know you can go underneath, I always see from the top there..."</i></p>	Common consensuses appear to be that the activities and the questions asked helped in the understanding of the sculpture. The activities are seen

<p>activity.</p>	<p><i>“Also about the way they ask (of the questions), we can understand more about the sculpture itself...we had to use creativity to think about it, to see what is the...from our point of view what do you think is the purpose of this artwork.”</i></p> <p><i>“Uh...there is 1 question where they make us sketch the 2 buildings...and then when I was sketching it, err...I noticed more details about it”</i></p>	<p>to provide a different perspective while the questions provide the knowledge about the sculpture.</p> <p>There were favourable comments that talk about the perceived benefits of using technology-supported learning tools.</p>
<p>Did you have a favourite sculpture?</p>	<p><i>“The wave thingy...Yar, the six...they were different heights and they were all unique in their own ways”</i></p> <p><i>“For me it is the Abundance because it looks very cool because it is 3D but it looks very much like 2D, and then um, the e-activity asked us to write a poem about what it is for and then I understood more about it.”</i></p> <p><i>“Um, I find the Helix really really very awesome...yar...Um because the sculptor used like um, um tiles, and then he um stacked up the whole thing and it was really really very tall.”</i></p>	<p>Sculptures cited by students all required presence on-site to feel its impact in terms of size, weight and form.</p>
<p>Did the presence of the teacher at each sculpture help in your understanding of the sculpture?</p>	<p><i>“There was information on the iPad that help you tell, tell things about the sculpture”</i></p> <p><i>“Not really, because mostly when we go, the teachers, we just ask them for technical help.”</i></p>	<p>The presence of the teachers is perceived as mostly unnecessary as the iPads provided all the required information for learning.</p>
<p>Would the experience of the sculpture walk be the same for you if it was done</p>	<p><i>“No...because you can’t feel it, you can’t smell it (the water)”</i></p> <p><i>“No...because we have to go through like seeing how big it is, in real life size”</i></p> <p><i>“Because online they mostly just put one picture over there and then ask you to describe it...then then when you are there in real life, you have to see</i></p>	<p>All students perceived that web-based learning alone would not be helpful towards the experience of the sculpture. Students gave reasons</p>

online via e-learning instead?	<p><i>it, see it through many different angles and understand it matter rather than online where it is through one angle.”</i></p> <p><i>“No...Because it is a different feeling...because it is like when we first saw the six brushstrokes through the photos it looked very small. And it’s like..yar..But after um, I saw it in really life, it looked more majestic.”</i></p>	which implied that web-based learning was not effective as it serves mainly as a tool for information gathering rather than the experience of the sculpture.
What were your feelings at the end of the sculpture walk?	<p><i>“I feel, I feel like I have achieved something.”</i></p> <p><i>“...learn about the elements of art...”</i></p> <p><i>“I feel that the art, of each station was quite nice, and we seem to appreciate it more than before...the art trail.”</i></p>	The aesthetic appreciation is seen through the emotional reactions, feelings and the students’ comments about the sculptures at each site.

In addition, stations like those of the large water attraction, Fountain of Wealth, which utilizes the camera function in the activity, tend to feature more prominently in the area of aesthetic experiences. Mobile technology thus can be seen to heighten perception and the aesthetic experience. However, the reverse reaction was found when it came to using the camera to take a video at the sculpture of the Soaring Helix. Some students spent a large amount of time at the sculpture trying to obtain a ‘perfect video’ and failed to observe the essence of the sculpture. The camera then serves to draw the focus away from the sculpture instead of helping students to pay more attention to it.

It was noticed that the activities which resulted in convergent answers, like that of the jigsaw puzzle, tend to result in less participation from all the group members. Instead, usually only a couple of students in the group will contribute to getting the single, most accurate answer. Once it is done, there is no room for negotiation as the solution is fixed. However, those activities which gave room for various solutions to the task, e.g. taking photographs or the writing of the haiku, resulted in greater involvement from more (if not all) members of the group.

The use of mobile technology allowed for greater mobility and the ability to be connected while on the move. This greatly assisted in students learning as they were able to access the internet via the tabs in the app to obtain information while viewing the actual sculptures at the site. This finding contradicts John Dewey’s belief that theoretical explanations impedes the aesthetic experiences but instead it appears that this access to information helped further their understanding of the sculptures and gave them greater insights such that it adds to their aesthetic experience (Dewey, 1934).

Table 2: Description and Samples of Teachers Comments

Questions	Teacher Comments	Researcher's Inference/Notes
<p>From your observations, what were the students' reactions like when they approach the sculpture?</p>	<p><i>"I should say expression would be...most of them tried to touch because I think the rest, they didn't had the opportunity to go near, especially the Lichtenstein to touch...so this one was um, made available for them to touch it and feel and so most of the boys were hugging it, trying to feel it, and all that..yar"</i></p> <p><i>"So the technical aspect of it...but taking picture I think they, they were a little carried away because for the pictures because some of them took with the artwork...they were part of the artwork..."</i></p>	<p>Students were very excited when they approached the sculpture. They participated in the work by being part of the work. The need to touch and feel the art pieces in order to understand the work appears to be a highlight for them.</p>
	<p><i>"Oh, the drawing one...oh, they had a bit of a difficulty because I think they, they were expecting to see nice pictures...and they don't have a tool to draw but only their fingers so they find it so difficult and um, most of them were not very happy with what they draw... with their fingers"</i></p> <p><i>"Yar yar, they were very excited, not really frustrated they just thought it was quite cool.... Because different station offer them different activities...so, like my station the photo-taking one was quite fun for them in a way because they have to go from different angles then they had a lot of...some had arguments lah, like from where, which and that kind of thing"</i></p>	<p>Students' appeared to spend a large amount of time doing the activities and hence deprived themselves of the experience of the sculpture. In addition, the activities did not match their expectations of quality.</p> <p>Lens based activities appeared to result in more engagement and enthusiasm amongst the students.</p>
<p>Did you notice if the students</p>	<p><i>"Um...they were trying to associate with the uh elements...uh trying to see which elements would this fit...are we talking about shapes here or are we</i></p>	<p>Students could link their observations to</p>

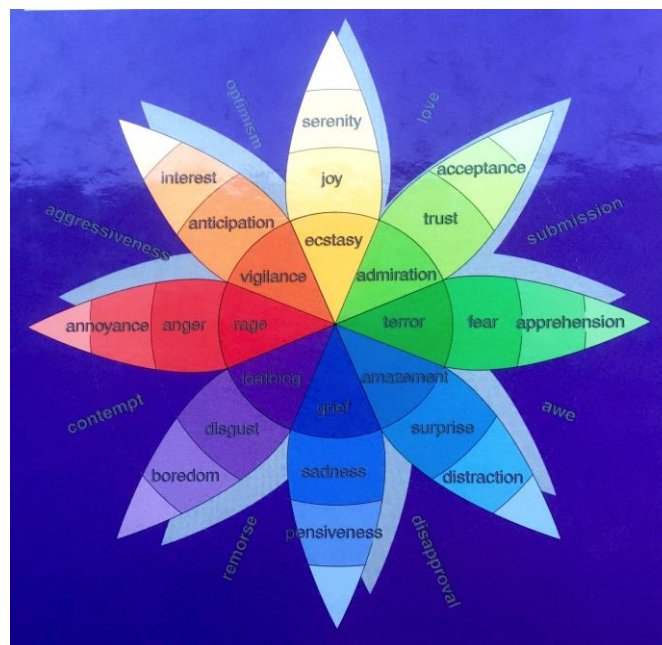
<p>used any prior knowledge or experiences when viewing the sculpture? If yes, what and how did they do that?</p>	<p><i>talking about lines...or I mean um those type of questions.”</i></p> <p><i>“Ok, the Litchenstein, because they did the Litchenstein work in class, so they were trying to see how much they had learn reflected in the artwork. So they were trying to give ‘eh, this doesn’t really look like Litchenstein, it doesn’t really look like this, this doesn’t really look like his brushstroke’, you know, trying to figure out what they know with the artwork.”</i></p> <p><i>“the Abundance, because Haiku, er students, I don’t think they they would see how art is related to poetry making or things like that but when we put it in that kinda of er..force them that it is an activity that they have to complete then er...I guess it actually brings them out from the, the standard thinking of the you know, always have to take picture, video, things that are visually moving or aesthetics related, but instead it is all in text.”</i></p>	<p>items that they have seen before and other schemas.</p> <p>Critical and analytical thinking were also seen through students association with previous lessons learnt as well as trying to see relationships between 2 different art forms – sculpture and poetry.</p>
<p>Do you think the experience of the sculpture walk would be the same for the students if it was done online via e-learning?</p>	<p><i>“Via e-learning? No, I don’t think so. Because some of these uh... structures here, I mean the sculptures here, uh, you are looking at the massive size, uh, the fact that you can actually touch, you can go through, you can interact, all these you are not able to do it via e-learning. I mean, talk about size alone, some of it you are walking into the uh fountain, so you, you will not get that same experience.”</i></p> <p><i>“Err...of course not! Because er...it’s more authentic learning when they get to go there and be part of the sculpture because certain things like getting into the sun, seeing how the water comes out of different parts of the sculpture is very different from looking at it in pictures...so it’s a lot better when they are there to see and feel...in in terms of scale yar, it actually er, brings them to...things that are different lah...basically not the textbook pictures kinda thing”</i></p>	<p>Both teachers see the merit of being at the sculpture site and related the experiences gathered to that of the senses – sight and touch. In addition, the setting and ambience of the sculpture site itself appears to play a part towards the aesthetic experiences.</p>
<p>How do you think the students can apply / have applied their learning from this</p>	<p><i>“I think that they can apply, um.....the fact that all the time they have seen artwork in 2D, and now they are seeing it first time in 3D, so, if they have an assignment that is demanding them to do in 3D, I think they may be able to you know, understand what a 3D should be and focus more on the form, the dimension and all that because at the moment,</i></p>	<p>Learning seems to be related to perspective (2D to 3D) as well as that of the elements of art (texture).</p>

sculpture walk in their art making?	<p><i>everything is flat for them and this is a different experience for them.”</i></p> <p><i>“I think after the walk er how they can use this in their art lessons or in their art making would be their...probably their ...would be a lot more sensitive to textures”</i></p>	
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Through the teacher interviews (Table 2), it was noticed that the students were very excited when they approached the sculptures. This emotional response of excitement falls under Robert Plutchik’s wheel of emotion, where excitement is seen as a subset of zest which is in turn a subset of the primary emotion of joy. Joy is just step away in the colour wheel from the most intense emotion of ecstasy, which would be the highest emotive state that a viewer can experience when looking at the work (Figure 7). Following Dewey, this emotional response of joy from the students therefore lends itself towards building a qualitative unity which can eventually give an aesthetic experience.

In addition, there was a sense of awe detected at the Fountain of Wealth and the Six Brushstrokes, and this was corroborated by both teacher and students *“I just thought ‘Oh my God!’ Because it is very big”* and *“They were they were more er... they were kinda overwhelmed by the whole structure”*. This supports Plutchik’s theory of emotion where ‘awe’ is featured as one of the eight primary emotions and is a composite of the emotions of fear and surprise. Based on the emotional reactions, the students’ sense of sight appeared to be completely filled with the viewed object and this resulted in them being thunderstruck. This awe when viewing a piece of art is relevant to Edmund Burke’s concept of the sublime, where the physiological effects of the sublime, in particular the dual emotional quality of fear and attraction would result in a person being thunder-struck. According to Burke, the mind is entirely filled with the viewed object that it cannot entertain any other, causing the effect of the sublime, the attainment of the highest degree of the aesthetic experience (Goldblatt & Brown, 2005). From the emotional responses therefore, the students’ appeared to have attained an aesthetic experience while viewing these two sculptures.

Figure 7: Robert Plutchik's Wheel of Emotions (Plutchik, 2003)



Source: Cover page of Robert Plutchik's Book Emotions and Life

There was a common consensus across the students and teachers interviews that there was a need to be on site in order to fully experience the sculpture, *“they can actually go around near and feel the texture and things like that...so I would think it is a lot better than compared to if they had done it on e-learning”*. The students' interviews on how walking around helped them in understanding perspectives better as well as the 'need to touch' and not just look at the sculpture, reinforces Herder's notion that sculptures are appreciated by the sense of touch and that this touch helps to form the concept of the three dimensional form and combines with vision to give the viewer a sense of the aesthetic experience of the work (Zucker, 2009). Through the contact with the sculpture via touch, some students ended up being *“part of the artwork”* when asked in the activity to take a picture of the sculpture. This physical interaction with the sculpture appears to provide a means with which students could identify with the work and possibly increasing their enjoyment of the sculpture.

Both students and teachers agreed that the sculpture walk should not be conducted via e-learning at home but instead see value in the authentic context of each site towards achieving an aesthetic experience *“Because er...it's more authentic learning when they get to go there and be part of the sculpture because certain things like getting into the sun, seeing how the water comes out of different parts of the sculpture is very different from looking at it in pictures...so it's a lot better when they are there to see and feel...in in terms of scale yar”*. This is akin to the notion of situated learning, where through the process of participation (mobile app activities) in an authentic context (sculptures on site), students are better able to integrate their experiences.

Although the mobile art trail was considered mostly successful, there were some limitations in the use of technology to conduct the trail. The most prevalent problem stems from that of poor network connection. Although each iPad had their own SIM

cards with wireless connection, all the groups accessed the mobile app at the same time causing the site to load fairly slowly and was sluggish. In addition, some of the picture resolution on the site were fairly large and coupled with the addition of third-party apps within the site, added to the slow download speed. Therefore, even though it is agreed that mobile technology allows greater mobility and the ability to be connected while on the move, the management of resources concerning the use of this technology, if not deployed properly, causes learning to slow down. This contradicts the thinking that technology which is expected to make learning faster, actually causes delays in learning instead.

Fragmentation could also be observed in relation to the experiences and learning styles of the students. This could have been caused by technical problems like that of network connections and glitches with the device or the application but in some cases however, the problem was with having shared technology. Due to the limitation of resources, students were divided into groups of four with each group allocated the use of one iPad. However, it was noticed that if the group dynamics do not work out or if students were not given opportunities to hold the iPad to work on the activities, the effectiveness of mobile app on the aesthetic experience was diminished. This was further emphasized by one of the students' reflection that he was deprived of the opportunity to do the walk because his friend refused to give up the iPad "*I didn't get to do anything...Darren, Darren said that I will make a mess of it so yar...*"

The design of the mobile app was done as a means to facilitate the acquisition of learning. Aside from the camera function, one of the features of the mobile app included the tabs at the side where students could conduct their own search to acquire information that was not provided just by viewing the sculptures. This was to facilitate self-directed learning such that students are able to navigate to the various sculpture sites and obtain the necessary information to complete the activities. However, the expectations of students with regard to learning with the mobile app did not match those of the teachers. The students' saw the technology as another means of delivering their learning and they expected the software to teach them the same way a teacher would demonstrate to them in class. However, this was not so from the viewpoint of the teachers who felt that the app itself was sufficient for students to acquire learning and did not feel that they needed to facilitate at all. There was still learning involved, but the form it took was unexpected. The learning expectation appeared to be that students expected learning to be delivered rather than acquired, which was the teacher's perspective. Independent learning therefore was absent but it was still self-directed because of the mobile application.

To conclude, it appears that technology does facilitate learning because it funnels all experiences and learning through one platform, in this case, the mobile app. However, the aesthetic experience is about accessing the object (sculpture) via multiple ways - through sight, touch, sound and the emotional senses, and these are areas which technology cannot capture all at once. Therefore, although the increasing use of technology in the teaching may result in enhancing learning, it appears that the same technology can work to impede the aesthetic experience for the student.

The Impact on Curriculum and Pedagogy

The results of the study showed that the use of the camera does help students to notice better as it allows them to get closer to the sculptures. This technology provides many opportunities for students to zoom into a sculpture, to closely examine areas that they might not be able to access due to the size and space that the work occupies. In addition, through structuring the camera activity such that it requires students to capture the sculpture in an aesthetically pleasing manner, it forces students to study various angles and viewpoints which they would have otherwise not paid attention to without the frame of the camera. Due to the relationship that students have with lens-based media, activities which focus on using such tools did ignite a greater engagement level with students and help them to better pay attention to an artwork.

Based on the interviews, it was evident that it was not the iPad alone which helped in the noticing of sculptures but rather the kind of activities that were designed for the purpose of learning more about the sculptures. Divergent versus convergent answers as well as the difficulty level of each activity impacted the learning process and resulted in affecting the students' level of attention. Tasks which were deemed as 'too difficult' e.g. the jigsaw puzzle, resulted in students spending more time fiddling with the app and trying to find a solution rather than paying attention to the sculpture at hand, while 'easier' tasks like taking a picture allowed for more focused attention on the sculpture. Therefore, certain guiding principles need to be identified before the games and its appropriateness to the activity can be added into a mobile app. Instead of having a 'user-centred design', there is a need then to look at a more 'learner-centred design' in the design of a mobile app, where the "environments are built by valuing an individual's creative energy" (Thomas et. al, 2004, p. 173).

Conclusion

This case study was designed to explore the sculpture walk aesthetic experiences with the use of mobile technology at a sculpture site. Admittedly, the study had its limitations in terms of sample size and the time that was allocated to do the sculpture walk. However, although the findings from this qualitative study is a generalization of the whole student population, the purpose however was to enhance understanding of how the use of mobile technology can aid in the aesthetic experiences of sculptures for these students. From the responses gathered in the interviews, it was also not very clear as to whether having an aesthetic experience of the work is equitable to being better able to relate or understand the sculptures. Other tools of measurements might need to be used for future research in order to gather clearer indication as to whether students are truly experiencing an aesthetic moment with the sculptures or they just possess the head knowledge without having any emotions tied to the work.

The influence of mobile technology towards sculptures in terms of their inquiry and enjoyment of the sculpture supported the notion that mobile technology and learning theories can be used together to serve as catalysts for fundamentally rethinking how sculptures can be viewed in the future. However, the user satisfaction and enjoyment of the activities does not necessarily help students to notice better. To accomplish this, there is a need to move away from a user-centred design and look towards a learner-centred design (Thomas et. al, 2004) where the learning environments are adaptive, flexible and feature variability. This study therefore provides useful insight for art

educators in Singapore who share the vision of integration of mobile technology into art teaching and learning processes.



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Contact email: tan_mei_ling_audrey@moe.edu.sg





Blog for Sex Education for Teenagers

Sharay Lara Padilla, Universidad Nacional Autónoma de México, México

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Abstract

Mexico has a growing number of unwanted pregnancies in teenagers. The government family planning programs have failed in more than three decades to reduce the number of teenage pregnancies. Besides the problem of poverty in which men and women live are defined as adolescents by obvious physical changes resulting from puberty, but both actually remain socially, emotionally and economically children exercising their sexuality in a world with enough information, but most of it confusing. The Voluptuosidades Blog is a pedagogical virtual space for cross sex education through the Information Technologies and Communication, highlighting the formation of an erotic nature, the feelings (what I feel? Why I feel this way? And How it feels) and nutrition of the subject as self-affirmation. The blog will feature interviews, videos, informational text, instructional material and a chat that allows teens obtain the necessary information about sexuality from a perspective that teaches the importance of the body and its care.

Keywords: feelings, body, eroticism, nutrition, education, pedagogy human rights and health

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Introduction

Still do not know if globally we agree to have the same problems in sexual education. In Mexico teens have a lot of information about sexuality, but not because it is too much means it is important. The majority is full of stereotypical messages about eroticism and images that reduce the sexuality to an intercourse. But you cannot fight all this information that soaks to the teens in an uninformed and confused sexual education. Treat to block any information that does not propose a healthy sexuality is not sufficient and would even exhausting. Added to this we have an increasing number of pregnant girls from twelve years old, and further with socioeconomic problems in Mexico. The poverty in entities in Mexico is also factor but not the only one of this growing number of teenage pregnancies. Still do not understand the reason for this. It is true that those who have access to internet services are not the poorest, but a good number of teenagers looking into so-called "internet coffee" (businesses that sell internet usage by certain time) or at home, and spend their time surfing in internet for searching entertainment, do homework and to solve personal questions.

In Mexico the blogs have not been successful like in other countries, but in the last year the quintessential video blogs have been central to report on what is happening in the country. Talking about sexuality in a blog should be taken responsibly. Therefore, education is the main objective of this blog, informing adolescents about sexuality but with a responsible sexual education forming its erotic nature, his nutrition and his sentimental character. I reiterate that not all teenagers have home access to the internet, but the blogs may be used as a teaching resource in schools, which itself has access to internet or even the teachers could download the video and share it to students or may be used in any class as a teaching support.

The blog is called *Voluptuosidades* that means the enjoyment of sensual pleasures, both the sensations of the senses as sexual desire. The word comes from *Voluptas* daughter of Cupid and Psyche. The Blog development involves a utopia because utopias have the wealth to gather science, art, technology and philosophy and also make a review of the current state of things. The subject is disoriented before a lot of information about sexuality so a new discourse is necessary for improved to him, it is a right.

My statements in principle may be stated as follows:

- If the teenagers are more informed about their sexuality can make accurate decisions to benefit their health and their life project; provided that the information is designed in educational terms.
- Without body there is no sexuality so it is necessary to promote a culture of pampering, a physical culture that consider that the body is the main actor in sexuality and care is essential.
- Intercourse is not synonymous of sexuality. To think that sex is only the issue of sexuality is a mistake; as well as reduce the eroticism to pornography. Erotic is a feeling and like many others feelings involved in sexuality; this sensual love hits specifically on sexuality. The erotic enjoyment must be directed to be fairly pleasant and avoid selling of pictures, words or erotic activities as universals or that infringe basic human rights.
- When we offer sex education is not enough with provide contraceptive technology without incorporate sentimental education. Feelings do not only live when we are

happy, they are also of displeasure and recognizing and understanding about our feelings can lead us to a state of wholeness, in which all feelings are part of the human experience.

The idea is that the blog is a space where the teenagers could watch, listen and obtain information on countless issues of sexuality. Information by and for everybody with quality and legitimacy. As an educator I care more about what is not said than what is said. This is because the first is an opportunity to propose, through the blog, of living a more informed sexuality and the second is already in the network and is difficult to change. So to cope to this information that eventually forms the teens subtly, is necessary to design and create spaces that promote a healthy and happy sexuality. The pedagogy seeks a sense of common welfare for all.

The feelings affect the person and are central in the experience of their sexuality. The problem is perhaps that many of these, that produce pleasure in specific, are sold as products that promise us joy, success, acceptance, status, sense of ownership and even love, but we are only consuming products and our body lives for a while very short a feeling of pleasure through a dress, a drink, a food product or an object, maybe when I finish the effect of this emotion will produce the opposite of what made us happy. Socially tell us what we feel? and how we feel? is part from pedagogy that changes the ideology; because education is the way to make an ideology and all have emotional and sentimental education, the proposal is to create educational alternatives through a different speech to modify this naive perception of reality or false consciousness about sexuality that is part of the ideology we have formed, ideology which is established at the moment we seem natural.

The fundamental aspect for the development of information in the blog is language. The language informs but also communicates and expresses. To counteract precisely everything that is said and what is not said, what is hidden, what is denied about sexuality in virtual spaces, is that language is fundamental space to transform the current hegemonic forms.

At the beginning I mentioned the purpose to forge the nutritional status, the erotic character and the feelings. Now I'll explain. Let's start with the nutritional status how does sexuality with nutrition? In principle, I mention forge each of these aspects because that's what it takes, forge them it's not as simple as we think, because from birth we are shaped. If the body is essential to the exercise of sexuality, it must be careful as best as possible. In Mexico has increased the level of obesity, especially in children. The cuisine of the country is abundant and rich in nutrients, but has been modified the intake and eating habits due to various factors, including the inclusion of excess or greasy foods that are not part of our original culture. The proposal therefore discussing sexuality has to start from appropriating our body and spend time with their care. Seriously think about what we consume every day and how we exercise with Dietetic that is a philosophical discipline of food ethics about how we orient our nutrition and recognize that our body is not a possession but a heritage and establish our biocorporal consciousness.

On the other hand, for forge the erotic character, first we must take into account the dimorphism sexual that beyond our sexual preferences, men and women are not equal but can demand equality of rights and obligations. Forging the erotic nature can be made through technologies of the self and an erotic literacy. Technologies of the self-

allow that an individual perform by his own or with the help of other features, a number of actions on your body, your soul, your behavior or way of being, getting a transformation of themselves and an achieve state of wholeness. That is, technology refers to how a person acts on itself.

At birth the first thing that the doctor sees are the genitals. The doctor identifies whether we are male or female and this classification is only the beginning of an education from the sexual dimorphism. To forge the erotic nature must also be established what is not. We cannot assume, no way, that the experience of sexuality has no limits and that by exercise of this enjoyment, everything is allowed. By contrast, the erotic enjoyment, enjoyment of sensual pleasures has limits that could even be universals. Each society requires and provides the rules on the exercise of sexuality which may or may not agree, but truth is that there are limits that must be legally established such as the exploitation of persons for the sex trade. Forced sex is not part of the sexuality health. That is why I insist that erotic pleasure is not a world where everything is possible, where everything is allowed, but the enjoyment of sensual pleasure is a range of respect for human dignity. People have a right to know that eroticism involves more than sex.

Finally forge the sentimental character requires analysis three elements in this order: Emotion, Feeling, Will. The emotion when it becomes more complex becomes in a feeling and Will is moved by emotions and feelings. The will, feelings and thinking always are hinged. As an educator I must first make a critical analysis, a reflexion of the sentimental styles and a critical examination of the sentimental education, establishing statements in principle about pedagogy of the feelings and pedagogy of the sexuality, that they are not the same thing. Sexuality is body and feelings, so that when the erotic character, nutrition and sentimental character is forged, should be considered a transversal education. Sentimental Education is what we feel and purpose is to be happy as much as possible, understanding that our bodies are alive and depend so much of feelings of pleasure as feelings of displeasure.

Conclusion

Sexuality does not start in adolescence begins at birth and is projected towards all aspects of the Human Being. The pedagogy seeks the common good and that's why we must engage in sex education, proposing alternatives from pedagogy of sexuality that is more than sexual response or sexual disorders are the enjoyment of sensual pleasures. The blog *Voluptuosidades* is a pedagogical proposal for intervention in the classroom which should expand to another spaces not only academics.

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Contact email: sharaylara@gmail.com



The Paperless Classroom

Laurence Craven, American University of Sharjah, UAE

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Abstract

This paper will discuss the implementation of the paperless classroom in the context of an IELTS class at a university in the United Arab Emirates. The advantages and disadvantages of the paperless classroom will be explored by focusing on different forms of technology covering: smart boards, iPads, overhead projectors and desktop computers. The implementation of the technology will be considered with reference to the technology acceptance model and the SAMR model. Furthermore, teacher and student attitudes toward the technology will be discussed and recommendations for practitioners will be provided.

Keywords: paperless, technology, iPads, IELTS, university

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New technology is constantly making its way into the classroom in an attempt to improve the learning experience (Melhuish, K. & Falloon, G., 2010). Many universities and schools are using computers and mobile devices in the classroom to enhance the academic performance of students. The United Arab Emirates (U.A.E.) is no exception, and in 2012 colleges and universities began to experiment with paperless classrooms in foundations departments. The aim of this paper is to outline my experience of teaching Foundations English in a paperless classroom in the U.A.E., highlighting the perceived drawbacks and advantages and to propose ways in which the paperless classroom experience could be improved.

The Context

The context of this paper is a Foundations English course in a University in the United Arab Emirates. In the U.A.E., students who do not have the prerequisite 6.5 in the IELTS are unable to enter into bachelor programs of study. These students need to take a two year course called the Foundation Year in which they study English for the purpose of passing the IELTS exam. The classes meet for ten hours per week and usually consist of a maximum of twenty students, where the four skills of reading, writing, listening and speaking are taught. The various colleges and universities in the UAE have different approaches to implementing the paperless classroom. In my case, teachers were presented with an iPad and a training course was given. The training covered configuring the Apple store, downloading an App, using the web browser and Keynote, working with Apple Movie Maker and practicing guided access in which the iPad's browser is locked to prevent students moving out of tests to prevent cheating.

A paperless classroom for the purpose of this paper will now be outlined. The classroom consisted of a physical classroom with a desktop computer connected to a projector and screen. The students and teacher used Blackboard 9 as the platform for course delivery. Students and the teacher were provided with wireless capable iPads. Classrooms were equipped with wireless connectivity and internet access. The required textbooks had been scanned in Pdf format; however, they were not in e-book format. Teachers and students were asked to not use paper in the classroom and to use the iPad as an alternative.

Perceived Advantages

The benefits of the paperless classroom were varied and apply to both teachers and students. The first advantage was simply not having any physical paper which can be lost or forgotten and may perish over time. Furthermore, a benefit for the teacher was the absence of having to make photocopies of each handout. Rather than making photocopies, a document could be uploaded to Blackboard and students could access the document using their iPads. A filing system did not need to be developed by students and even disorganized students would find their lecture notes organized for them on Blackboard, week by week. The use of the scanned textbook eliminated the problem of students forgetting their work and there was no need for them to carry heavy textbooks to class.

All textbooks, lecture notes and students' work could be stored on the iPad. By teachers uploading the course content to Blackboard, students found they could access and work on course content wherever and whenever they wished and interact with their teacher by e-mail. Students have different optimal study times depending on their family situation, commute, learning style and personality, therefore the flexibility provided with online accessible content could maximize their efficiency when studying. If a teacher forgets to assign homework, it could be assigned after the class. It allows the teacher more time to reflect on the class and decide what homework would be most appropriate. In addition, students could be reminded of their homework multiple times using the announcement function in Blackboard.

When presenting, the norm is for the teacher to be at the front of the class, so they can write on the board or scroll through Powerpoint slides. By using the iPad's mirroring function, whereby the iPad's screen is projected on the projection screen, the teacher is no longer tied to the desk and can walk around freely while presenting information on the whiteboard. This greater freedom of movement is useful as the teacher can circulate and ascertain that students are on track and thus eliminates a static environment.

The online aspect of the class using Blackboard and iPad access facilitates grade management. Grades are posted in Blackboard with a function called My Grades. The teacher and students can view a running average of the grades throughout the course and therefore anticipate their final grade, before receiving it. With grade negotiation being a large concern among faculty in Gulf universities, having a running average throughout the course duration, means grade negotiation is less prevalent.

Another useful function of Blackboard was the bulletin board discussion board where the teacher could post a discussion question and students were required to respond. This feature helps to ensure students read assigned readings and practice their response to in-class or at home readings, and is a viable alternative to checking homework in class. When students are absent from class, they can go to the lecture notes in Blackboard and read the notes and assignments they have missed. There is no need to make an appointment during the teacher's office hour and/or ask their friends for missed lecture notes. Any lack of concrete answers or misguided information from other students is also prevented.

iPads running the Blackboard app can be used during test time as the guided access feature of the iPad blocks most other functions to prevent students exiting the test and cheating. The tests that run through the Blackboard environment can be automatically graded by Blackboard. The results are sent to the teacher and students as soon as the test is completed. Students appreciate the immediate feedback and teachers are grateful for the extra time.

Students enjoyed working with educational apps on the iPads when the course schedule allowed it, and they used apps to practice spelling and vocabulary-building exercises. Making lessons more fun is one way to lower learners' affective filters and create incentives to learning (Rossiter, 2003) and the games provided an incentive. The game

element made the learning of vocabulary enjoyable and students commented on how they would find studying vocabulary less interesting if it was from a book. Mayo (2009) also found games to be of benefit to learners; results show the learning gap between various learners was diminished by creating gaming systems that can adapt to the pace of the specific user and capitalize on the variation in learning styles (Mayo, 2009).

Perceived Disadvantages

Although there were many benefits encountered with a paperless classroom, there were also drawbacks, some of which would surface unexpectedly and resolving them was not always possible during the class. The first issue encountered was the setting up of student iPads, which took a few hours of class time. Students were given iPads which the teacher needed to register, furthermore students had to register in class for the Apple iTunes store, to be able to download educational apps. It was decided that students were unlikely to be able to set up their own iPads; therefore, the setting up was completed in class. When an educational app was in need of being downloaded, explaining the process and the download often took around fifteen minutes due to forgotten passwords or an inability of the students to find the app in question. The situation was similar for setting up guided access for tests. Setting up guided access is a difficult and time consuming process because the teacher must cycle through several menus and input a password twice without the students seeing the password. Test length was usually forty minutes in a fifty minute class, but setting up guided access for twenty students could sometimes take up to fifteen minutes, due to the students at times being, uncooperative. After the test, the teacher would also have to remove guided access on each iPad which would take up yet more time.

The course textbooks had been scanned and uploaded on students' iPads in Pdf format. They were not true e-books, but scans that functioned as e-books, therefore they were lacking the hyperlinks and ease of use genuine e-books have. Answering questions or gap-fills in the scanned textbooks took students much longer than using a pen and a hard copy book. Students would need to input their answers with the iPad keyboard and then try to position the writing in the correct place by moving it with the touchscreen. This process was expressed awkward and time consuming by many students. The teacher could also answer on their iPad screen and mirror the answers on the overhead projector; however, like the students, teachers found this process time consuming and most wrote the answers on the whiteboard, thus negating the apparent benefits of the iPad.

Other problems relating to the technology itself were the fact that students sometimes forgot to charge their iPads and would come to class with a low battery, which would sometimes run flat in class. If this was the case, the student would not be able to share an iPad due to the difficulty of seeing the screen from an angle when sharing an iPad with another student. Although chargers were available, plugs in the classroom were limited. Although students were at first excited about studying English with an iPad, the initial interest and student engagement with the device was temporary and waned after the first few weeks of the term. During the second half of the term students felt that there was hardly any difference between studying with the iPad or with a book. Students were often

tempted to use social media and play games which made keeping them on task a challenge due to the distractions the iPads presented. A further issue related to not being able to easily view an iPads' screen from an angle meant that it was difficult for teachers to monitor student activity and check if they were on task.

The smart-boards provided in certain classrooms have advantages over usual whiteboards in that they have more functionality and the images could be saved; however, the smart board markers were occasionally broken, had batteries removed by students and the calibration of the marker and board was sometimes incorrect. Other problems relating to the technology was that the wi-fi internet connection occasionally stopped. A recommendation was to always have a back-up of photocopies of the textbook and worksheets, but this would negate the idea of having a paperless classroom and these photocopies would therefore be wasted.

If the wi-fi or servers had connectivity issues during tests or exams, as once was the case, students would file complaints as exams had to be re-taken and on occasion re-written, taking up valuable time and interfering with the course syllabus and timing. On a few occasions power-cuts to the electricity supply would take place and although the iPads were not affected, the desktop and overhead projectors would not function.

Students and teachers may need to get used to the technology Teacher attitudes towards technology can be explained as in the technology acceptance model TAM (Davis 1989, Bagozzi, Davis & Warshaw 1992). Davis et al. note that a number of factors influence student and teachers' decisions about how and when they will use technology. Perceived usefulness which is how the technology will enhance the teachers' job performance and Perceived ease-of-use which is the amount of effort that needs to be put in by the teacher to making use of the new technology (1992) need to be taken in to consideration as variables when implementing a paperless classroom.

Although the Blackboard online course management system had numerous advantages, an issue relating to students no longer listening to teacher instruction became evident. If the teacher did not post homework instructions on Blackboard as announcements, but only gave oral instructions, students would not listen or do the homework. They felt that if it was not written on Blackboard, it was not a genuine request for homework. If the teacher informed students about an up-coming test and the announcement was not shown on Blackboard students would often say that they were unaware of the test, therefore the focus had shifted from the teacher to the technology.

The technology was being substituted for paper without adding a large amount in the form of transformative outcomes due to a lack of teacher training. Most usage of the technology was substitution as in the SAMR mode 1 (Puentedura 2006). The SAMR model explains that substitution is when technology acts as a substitute with no functional change (Puentedura 2006). The budget for all the technology used was very large compared to a traditional classroom and it should therefore be adding more value to the classroom, such as redefinition as explained in the SAMR model. Redefinition is when the technology allows for the creation of new tasks, which were previously

inconceivable (Puentedura 2006). The reason for the lack of redefinition in most cases was the teachers' lack of training and experience with the technology.

Conclusions

After a term of teaching with the iPad as an alternative for paper and pen, it became clear that the iPad is not a viable substitute, although the two could be used in tandem. Blackboard a tried and tested online course delivery system, proved very useful and its advantages greatly outweighed the disadvantages. Furthermore, due to their enhanced functionality, laptops appear to be more useful in the classroom than iPads and it would be preferable to use a laptop computer due to the greater functionality, ease of navigation and practical keyboard. As the difference between laptops and tablets, such as the iPad starts to diminish and the difference between the two devices becomes blurred, the choice of which to use will become less of an issue. During the eighteen weeks of the term a small portion of time was spent on setting up the technology and troubleshooting, rather than on the course content. An on-call technical assistant who would be able to come to the classrooms when needed would be useful. Some of the faculty felt less confident in instruction due to the need to become accustomed to using an iPad and the problems with the technology they would encounter in the classroom. Further research and training needs to be carried out to allow faculty to maximize the benefits of the technology and to not merely use technology as a substitute, but for more transformative outcomes.

The logo for 'iafor' is centered on the page. It consists of the lowercase letters 'iafor' in a light blue, sans-serif font. The text is enclosed within a circular graphic composed of two overlapping, semi-transparent arcs: a red one on the left and a blue one on the right, which together form a partial circle around the text.

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*A Journey in Moodle: Lessons Learned in Institutionalizing an Open-Source
Constructionist Blended Learning Tool*

Dr. Rolando M. Lontok Jr., Nizwa College of Technology, Oman

Alice M. Lontok, Nizwa College of Technology, Oman

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Abstract

Utilizing technologies to enhance traditional forms of learning is an important task for institutions particularly in a maturing higher education system. The educational use of ICT is beset with literature that institutions can consult when embarking in such endeavour. Moreover, educational technology practitioners, closely coordinating and consulting with members of faculty and getting the required support from management, regularly discuss among themselves features of the system chosen, adoption and deployment strategies, support services that need to be rendered, and evaluation of different aspects of the system. These issues are of paramount importance for Nizwa College of Technology, as it implements institution-wide blended learning strategy in the delivery of courses. This paper reports the experience of NCT in implementing the said approach. It outlines issues the college encountered during the operationalization of the aforementioned pedagogy. The paper focuses on the continuous analyses of experiences of users on the use of the blended approach, as well as the technical capabilities of Moodle as the learning management system of choice for NCT e-learning activities. It aims to provide readers with lessons learned, NCT's on-going work, and its plan for the future regarding this matter. Institutions embarking on similar initiatives can take advantage of NCT's experience to ease their way in the implementation and get better understanding of deployment and related issues.

Keywords: Moodle, open-source, blended learning, LCMS, educational technology

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Introduction

Nizwa College of Technology (NCT) operates under the auspices of the Ministry of Manpower. It is one of seven colleges of technology in the Sultanate, governed by a Board of Trustees through the Director General of Technological Education. NCT is locally managed by the College Dean. NCT grew from offering technical-vocational courses to today's array of Diploma and Advanced Diploma qualifications in Engineering, Information Technology and Business Studies. The teaching faculty is a mix of locals and expatriates, which bring a wealth of expertise and experience to various academic programs.

Riding the higher education boom in the Sultanate during mid 2000s and to further reinforce it at NCT, the college management decided to implement a new method of delivering lessons: one which will make good use of ICT infrastructure, which the college continues to improve. The management decided to form a core group that will study how blended learning can best be implemented in the college (Lontok & Lontok, 2007) and what platform can be utilized to provide technical support and ease of use to students. A working group then started gathering data with the following objectives in mind:

1. Design a blended learning framework that can be best utilized institutionally;
2. Adopt an LMS that could be easily and effectively deployed without too much cost.

After consulting relevant literature (Brandon, 2006; Halloran, 2002; Zeilberg, 2001) and gathering relevant information by observing practices from other colleges and universities and simulating possibilities through short workshops, recommendations were made and the management gave the project a go for full implementation.

Planning for Change

As the management did not want a full paradigm shift in delivering lessons across all courses, the e-Learning Working Group (eLWG) decided to initially implement the project using the pilot approach. Through this, the group effected change through blended learning only in select classes in Engineering and IT, and decided to review the experiences of these classes afterwards, in preparation for the institution-wide implementation that is planned in the next phase. The eLWG, which spearhead the implementation, is comprised of one representative each from the three academic departments of Engineering, IT and Business Studies. The group is headed by the Assistant Dean of Academic Affairs.

To ensure that the work of the eLWG will be given adequate technical support in terms of network infrastructure and development of online activities and materials to supplement face-to-face interactions in various courses, its members worked closely with the Center for Educational Technology (CET). This further strengthened the implementation of the project and the active utilization of Moodle in the college.

Table 1 shows the initial responsibilities of the two groups:

Table 1
Roles and Responsibilities of eLWG and CET

	eLWG	CET
Roles and Responsibilities	<ol style="list-style-type: none"> 1. Conduct research on best practices regarding blended learning 2. Conduct research on LCMS and its implementation 	<ol style="list-style-type: none"> 1. Setup the Moodle LCMS and manage/maintain the system 2. Train users (staff and students) to use Moodle 3. Assist teachers to develop courses for Moodle

Aside from the roles and responsibilities identified in Table 1, the two groups also had shared responsibilities: effective planning and successful implementation of the shift to blended learning, as well as efficient use of Moodle LMS.

Once the implementation of Moodle was officially approved, a series of planning sessions and consultation with CET and academic departments followed. Ultimately, it was decided that in the pilot implementation, four classes will participate: 2 in Engineering and 2 in IT. Initially, no class will participate in Business Studies as there was nobody who could immediately lead the blended learning implementation in that department. Summarily, three teachers participated in the initial piloting of the project. They were supported by several staff from CET to provide technical support.

Through joint efforts of the eLWG and the CET, workshops in Moodle and blended learning were conducted to bring the idea to the mainstream and to promote the project as well. This allowed for better understanding of the project which set the tone for wider implementation in the next phase (Lontok & Lontok, 2008).

Success in implementing the blended learning approach hinged largely on the effort of the eLWG. Thus, aside from workshops conducted by the group, they also presented papers and studies in various symposia and conferences to bring stakeholders on board (Lontok & Lontok, 2007; Lontok & Lontok, 2008; Lontok 2008). Equally, success in implementing a new LMS is largely anchored on the effort of CET. Thus, CET staff provided direct support to both staff and students to get everyone involved and to make the transition as easy as possible. In this regard and taking the work of Chao (2008) as model and building from it, the group continued their work by tackling the following issues:

1. How to choose the right LMS and when is the best time to adopt and start the institutionalization of blended learning philosophy?
2. How to develop online materials and activities to supplement the existing courses?
3. How to provide adequate support for prospective end-users?

Choosing the LMS and adopting Blended Learning

Following initial discussions between the eLWG and the CET, it was decided that a series of brainstorming sessions should first be done with the staff involved in piloting the project. Likewise, a series of discussions should be done with the technical support team, as they also need time to setup the Moodle environment and make sure that online courses area ready to be uploaded and can be used by learners.

Once these discussions were done and issues discussed and deliberated upon, it was decided that a semester will be set aside for the preparation, testing and setup, and development of online courses, and the initial pilot implementation will start in the succeeding semester. With that, the project started to roll.

Once everything is planned and agreed upon, consultations and further discussions ensued between the eLWG and the concerned teachers. An initial survey was also conducted for students to get their feelings and ideas about having an e-learning facility through Moodle. Based on the results of this survey, students, though little skeptical, were also interested in the new approach, and they were willing to participate and try. Although there were few resistances, the general view was that this is the change that is required particularly of a technological institution like NCT.

Following are the key lessons learned by the college in this area of implementation:

1. Conduct brainstorming and discussion sessions with concerned stakeholders, ensuring that they understand the change issues involved to ensure clear communication and understanding of the phases of the project;
2. Get as much information as possible regarding the LMS to be implemented, making sure to understand incompatibilities with existing infrastructure so that issues could be immediately addressed;
3. Come up with proper planning regarding customization of the LMS so that it will fit the implementation schedule.

Developing online materials and activities for courses

The development of online materials and activities in the pilot implementation was comparatively easy compared to the next phase (succeeding academic years). This is because of the fewer courses involved and the fact that teachers who participated in the pilot implementation had prior Moodle experiences.

A series of workshops were conducted using these courses as actual examples to prepare other staff for wider implementation in the next phase. A comprehensive manual regarding the use of Moodle for NCT was also prepared (Lontok & Lontok, 2008). A special online course in e-learning was also created for teachers so that they could practice in the actual Moodle environment.

As the pilot implementation progresses, eLWG and CET groups continue to work in the background to further improve the implementation as their understanding of the technology deepened. eLWG also continued giving seminars on blended learning approach, as well as workshops on other e-learning products such as Hot Potatoes and other Adobe products. CET's improvement works in Moodle continued as well. To

make the system more robust, they replaced the platform to Linux (from Windows), and adopted MySQL as the backend in the succeeding implementation.

As the implementation progressed, the groups set their sights on the institutional implementation planned for the next phase. Thus, improved course design, faster course development process, more specialized faculty training, and more effective communication of the complexities of the technology and the philosophy became new priorities. NCT started to collectively redefine its processes and rethink its services in its effort to institutionalize the new philosophy of blended learning using the web-enabled Moodle LMS.

Lessons learned from experiences in this area of implementation are:

1. Come up with a very good plan regarding the development of online supplementary materials for courses;
2. Give focus on staff training on the new system, and don't stop with the training plan;
3. Continuously monitor the online course development process, instituting required adjustments as the project rolls, to keep pace with the changes.

Providing end-user support

Students at NCT are given IT Foundation courses in their Foundation Level. When the college started to institutionalize blended learning, Foundation Level students were also introduced to Moodle by integrating it to their Foundation Level IT courses. Later, all multimedia courses in Foundation Level were required to be conducted using Moodle. Aside from this, CET staff also provided regular Moodle orientation for students.

In the case of teachers, the process was a little bit more complicated as they need to grasp a better understanding of the features of the system since they have to use it regularly to integrate parts of their materials in online activities. In this regard, CET scheduled more stringent workshops for staff throughout the semester. This slowly evolved into intensive tutorials of Moodle features by members of eLWG, assisted by CET staff, for each academic department. These regular tutorials and workshops were further supplemented by requests for more workshops on specific Moodle features, which were requested by academic departments from time to time.

Although the initial stage of providing workshops and tutorials were beset by some unavoidable "growing pains" such as slow response to obscure issues and problems encountered and changes to some system features as they are improved and made stable, a system was slowly developed, whereby first tier assistance and support from CET is further backed up by more specialized support to make the technical support and LMS tutorials more systematized and effective. Subsequently, the e-learning course previously created for seminars and workshops to prepare the faculty evolved into a central repository of information and a central discussion forum where issues are lodged by users and answered by technical support staff.

The evolution of a systematized support and tutorial system became an important part of CET's change management strategy, as providing relevant feedback and

communicating quickly with individual users was of paramount importance. Information taken from these channels was also continuously and regularly provided to the Moodle team in CET to quickly fix technical issues and further improve the system.

Some important lessons learned from the college experience in this area of implementation include:

1. Development of training and other resources (e.g. manuals, quick guides) for all end-users;
2. Creation of a dedicated team that will handle end-user training and support;
3. Giving focus in the development of feedback channels that prioritizes giving timely responses to users' queries and other needs.

The next steps

After the successful initial implementation of blended learning philosophy and the Moodle LMS in the college, NCT started institutionalizing the implementation of its e-Learning Mediated Blended Learning Approach through an internal decree.

In this context, a plan was made on how courses will be created and how students will be registered. As the college registration system is a customized system built by the MIS Department of the Ministry of Manpower, there was the problem of directly connecting it to Moodle. In this regard, it was decided that new students will be generated from this system and will then batch-uploaded to the Moodle database. The students in turn will be registered by their respective teachers in individual courses. Although burdensome, this process eventually became the standard procedure for teachers during the succeeding semesters. This eventually became an important part of the blended learning strategy in NCT. Just recently, this process was slightly modified when the college migrated to Moodle 2.4. Instead of the usual batch upload of students to Moodle database by CET and then registration of students by their teachers in individual courses, the process had now been tremendously improved through batch uploading of eLWG of students in their respective courses and classes, thereby removing the burdensome step of individual student registration by teachers in various classes and sections. This greatly minimized administration and housekeeping work of teachers, giving them more time to focus their effort in improving the instructional design of their courses.

Lessons learned in the pilot implementation, particularly in the management of individual courses, became important points of discussion in the continuous orientation and workshop sessions that eLWG and CET provide to the different academic departments. The practice of regular seminars and workshops continued, as it proved very effective in familiarizing users with features of the Moodle system. As users better understood the system, more features were used and became standard. These include chats, wikis, improved utilization of discussion forums, attendance and online gradebook.

In terms of the functions of the eLWG and the CET groups, the groups were combined and streamlined and is now comprised only of the academic department e-learning representatives, the Moodle server technician, the web developer, and the Head of IT Department (former Head of ETC) as the leader of the group. The group

still provides regular reports to the Asst. Dean of Academic Affairs, who is now mainly concerned in the strategic aspects of implementation and not in the group's day-to-day activities.

Despite the challenges in adopting a new philosophy of delivering lessons and embracing new technology for learning, it was found out that after several semesters of implementation, majority of faculty and students embraced the change. From surveys that are conducted from time to time to get satisfaction and other opinions of users regarding the system, they felt that the new approach provides an alternative form of learning that gives them more flexibility in accessing information, as well as improved communication, especially between classmates (males and females), that would not normally have been possible in regular face-to-face scenario based on their norms and culture. Faculty members also appreciated tools that made the administration part of their teaching work easier.

Lessons learned from NCT experience after the pilot implementation include:

1. Establishment of a system for registering users in the LMS and making it an integral part of the process;
2. Conduct of regular workshops and tutorials regarding features of the system for all users, and conducting these year-round;
3. Establishment of an efficient flow of communication among all stakeholders.

Looking ahead

After several years of NCT's Moodle implementation, users, particularly teachers and technical support staff, look into better course development, more integration, and online course quality.

NCT's online course development process is still a work in progress, and it will probably stay that way. As new technologies are developed, there will always be new ways of developing online courses. The current focus is in effective instructional design and better integration with other open-source collaboration tools. The college is also successful in implementing Google Apps technology in other aspects of its operations, particularly in teaching and learning, and it will be an important milestone if a system or process would be developed which will integrate the two technologies, thereby enhancing user experience.

Another issue is quality. As online courses development improves and become mature, better quality can be achieved through an effective collaborative course development approach. The emphasis now is to give focus on identifying faculty needs and supporting them to make this new development model a reality. The goal is to empower faculty to develop and teach blended courses while maintaining high quality standards. This, and an effective training plan, should be incorporated in the college change management plan to ensure continuous effectiveness in this endeavor (Wallace & Young, 2010).

Conclusion

After several years of implementing the blended learning approach in delivering lessons anchored in e-learning through Moodle, it can be said that NCT has achieved considerable strides in enhancing the teaching-learning experience in the college. In this context, it is important to recognize the lessons learned in this journey, so as to identify proper change management strategies in various important issues such as becoming effective change agents (for staff and/or units), supporting stakeholders in adapting to changes in philosophy and technologies, communicating the change effectively to users, and monitoring development to assess success.

NCT is now looking forward to the next steps in further improving its approach. For sure, there will be more hurdles and challenges ahead, particularly in the area of LMS: the college has just migrated to Moodle 2.7, and is now focused on developing more quality courses; it is also still trying to find effective ways on further making trainings on blended learning and LMS better. Meanwhile, the eLWG and the CET continue to collect relevant data to establish NCT best practices in the blended learning area.

We believe that this is the only way we could have better planning and come up with better decisions regarding our approach in the coming years.

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Contact email: rolando.lontok@nct.edu.om

Exploring Approaches to Help Students with Reading Disabilities Enhance Their Reading Comprehension through the Use of the Tablet

Ruey-Shyy Shieh, Kainan University, Taiwan
Ting Fang Wu, National Taiwan Normal University, Taiwan

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Abstract

Reading is the foundation of learning in formal education. In the mobilized digital century, how the mobile device can facilitate the reading of students with reading disabilities (RD) is of interest. The purpose of this study is to explore text display modes suitable for students with RD, based on a mobile device. The study also investigates the impact of collaborative learning, as opposed to individual learning, on students with RD. The research design consists of five stages, including preparation, development, testing, modification, and implementation. Four types of reading articles, randomly corresponding to four presentation styles have been designed, including plain text, text embedded with key phrase explanations, text highlighted character-by-character, and text with audio. The study subjects are mainly 3rd to 5th grade students. Data collection includes reading test results and related information (e.g., time spent on reading and time spent on replying to questions), a 3-item questionnaire, and observations. Presently, the first three stages have been completed; it is currently in the fourth (modification) stage. Eight RD students participated in the testing task, with two engaged in individual reading and the other six engaged in paired reading. Based on the pilot test findings, several areas in the reading design need to be modified, such as adding phonetics to all Chinese characters displayed, making option buttons more salient, and replacing one of the display modes with a new, more helpful mode. The modification is expected to be completed by the end of May. The final implementation will take place in June.

Keywords: Checkpoint-based design, collaborative learning, mobile reading, reading disabilities

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Introduction

As of March 2014, the number of students with special needs in Taiwan, including in elementary, middle, and high schools, was 100,814. Among these students, those with learning disabilities reach 28,557, accounting for 28.3% of the total number (Special Education Transmit Net, Taiwan, 2014). Reading disability is among the various types of learning disability. Reading is the foundation of learning in formal education, and entails absorbance and comprehension of the content read. The reading process involves complex mental abilities, including word recognition, comprehension, fluency, and motivation (Breznitz, 2006). Therefore, when students have a reading problem, they are likely to encounter comprehension difficulties which will subsequently affect their reading fluency and motivation, and may eventually hinder their knowledge acquisition.

Technology has been used as an auxiliary tool to assist learners with disabilities in their learning. In the mobile age, handheld devices such as cell phones and tablets, rather than desk-top or lap-top computers, have increasingly become the most widely-used media for attaining and conveying information. The user interface of the handheld devices is viewed as more humanized as it is based on a multi-touch design, enhanced with multimedia features, such as text, graphics, audio and video. Shah (2011) reported that tablet computers are helpful for students with disabilities, as applications are available for them to substitute for bulky older types of assistive technological tools. The purpose of this study, however, focuses on exploring display modes appropriate for students with reading disabilities (RD) to read when they are using a mobile device to engage in reading tasks. Two purposes are addressed in this study:

1. Examining the impact of different types of text presentation on the reading performance of students with reading disabilities; and
2. Examining the impact of collaborative learning, as opposed to individual learning, on the reading outcomes of students with reading disabilities.

Literature Review

Enhancing Reading with Technology

As the technology has advanced, the presentation of reading materials has changed accordingly, particularly in terms of changing from paper mode to electronic mode. Electronic reading materials such as e-books and interactive books integrate multimedia into reading content, such as pictures, animations, audio and video, to more dynamically present the content and concepts conveyed. This type of dynamic presentation is helpful for increasing reading comprehension as it allows readers to discern the text messages through multiple approaches, rather than reading pure text (Chun & Plass, 1996; Hanley, Herron, & Cole, 1999). Some researchers have claimed that integrating a reading support system to facilitate the engagement of students with learning disabilities in "reading to learn" is a helpful approach (Ko, Chiang, Lin, & Chen, 2011).

Fun-Oriented Learning

Chuang and Chen (2009) compared the impact of computer-assisted instruction and computer-based game teaching on the learning effect of elementary school students, and found that the latter significantly improved the students' learning memory and also reinforced their problem solving skills through helping them understand multiple available solutions. Similarly, the survey results reported by Attewell and Savill-Smith (2004) indicated that the young people highly interested in mobile phone games improved their abilities in the areas of spelling, reading, and math. Chuang, Lee, and Chen (2010) contended that digital console games helped children with learning disabilities to learn, especially those with attention disorders.

Technology-Supported Collaborative Learning

Computer-Supported Collaborative Learning (CSCL) refers to using collaborative learning in computer-assisted learning situations. An experiment conducted by Dillenbourg (1999) indicated that CSCL helped improve children's learning performance more significantly than did individual learning. Wang and Chen (2008) investigated the impact of learning methods on students' learning performance, in a study in which 139 junior high school students conducted an ICT project using peer collaboration. The study results revealed that peer learning could enhance the comprehension ability of the students who had an imaginative learning style, and had a compensatory effect on the expressive style of the students. Huang, Yang, Huang, and Hsiao (2010) reported that collaborative learning positively affected knowledge network construction. Tseng, Hwang and Chan (2005) disclosed that using mobile devices as assisting teaching tools significantly helped student collaboration in the classroom. As mentioned, mobile devices have been reported as being able to help increase student learning interest and also facilitate their learning. However, students with learning disabilities are a highly heterogeneous group; therefore, whether the aforementioned learning methods are suitable for them requires further investigation. In this study, not only text display mode but also a reading approach suitable for students with reading disabilities is examined.

Methodology

Research Stages

To achieve the study aims, five research stages are included:

1. Preparation: prior to developing the reading system, two experts, who are educators, teachers and/or counselors, with experience of teaching students with reading disabilities, were contacted to elicit information regarding the general learning situations of students with reading disabilities, their reading levels, reading styles, interaction styles, and personalities.
2. Development: four components were considered when developing the reading materials, including (1) the display aspect, (2) the checkpoint-based design, (3) the user interface, and (4) the automatic recording feature. These four components are described in the following Research Design section.
3. Pilot test: five to ten students with reading disabilities were to be selected to participate in the testing task. A rubric form was created to track the students'

information, one for each, including their reactions to using the mobile device, the materials designed, and the reading interface developed.

4. Modification: the reading system will be modified based on the feedback collected and observed from the students participating in the pilot test.
5. Implementation: After system modification, 24 students with reading disabilities will be chosen to participate in the reading task. In addition to answering checkpoint questions, the participating students will also answer questions after finishing reading each article.

Research Design

To explore the text presentations suitable for students with reading disabilities (RD), four components were considered when designing the reading materials.

A. The display mode

Four different presentation modes were designed to display the reading content: plain text, text embedded with key phrase explanations, text highlighted character-by-character throughout the article, and text with audio.

B. The checkpoint-based design

To increase the students' reading interest, four checkpoint questions were added to each article, similar to the game-based learning design. At the beginning, the students are instructed that they will play a reading game, in which they will encounter a number of checkpoints (multiple-choice questions), and that they will need to pass the checkpoints (by answering the questions correctly) in order to reach the finish line. After successfully completing the reading, each will be rewarded with a small gift.

C. The user interface

The students can choose the size of the text before and during reading. In addition, when reading the article displayed with the character-by-character highlighting, the students can select the text display speed (0.5 seconds and 1 second).

D. The automatic recording system

The system was developed to automatically keep track of the information associated with each student's responses, such as time spent reading each article and time spent answering each checkpoint question.

Participants

For this study, we selected elementary school students, particularly third to fifth graders, as the study subjects. These study subjects were selected from the Special Education Transmit Net posted by the Ministry of Education, Taiwan. The selection criteria were:

- Students certified as having a reading disability by a special education accreditation institute;
- Students with reading disabilities currently enrolled in an elementary school;
- Excluding those who have physical disabilities, visual or hearing impairment, emotion disorders, or mental retardation;
- Having an IQ of 70 or above.

As stated, five to ten students with reading disabilities were to be selected to participate in the pilot test, and a total of 24 students will be chosen to participate in

the final experiment. For students with reading disabilities, collaborating with one peer may be a rather challenging task. Therefore, in this study, we intend to pair students, as opposed to grouping multiple students, for the collaborative learning experiments. The pairing method will be based on individual students' aptitude, preference, and willingness, rather than mandatory assignment. Those who are engaged in individual reading will read the articles alone, whereas those who are assigned to collaborative reading will read the articles in pairs. Each student/pair will read the four articles where each article is randomly matched with one of the four presentation modes.

The Tool

The 7-inch tablet was selected as the research tool for this study. The Android system was adopted to design the reading materials as it is a free, open-source system.

Data Collection and Data Analysis

Both quantitative and qualitative data are being collected. The quantitative data consist of test results, a 3-item questionnaire and system logs, such as the time each student spends on reading each article and answering each question. The qualitative data are mainly the observation records. A rubric form has been created for recording and tracking the students' information, one for each, including their reactions to using the mobile device, the materials designed, and the system developed.

The following comparisons will be made to reflect the impact of the various design and learning approaches on the students' reading performance:

- Differences in student performance among the four display modes (plain text, text embedded with pictures, text highlighted character-by-character, and text with audio); and
- Differences in student performance between individual reading and collaborative reading.

The qualitative data will be analyzed using content analysis. The data will be coded, classified, and analyzed. Both the quantitative and qualitative data will be triangulated to strengthen the reliability and validity of the study findings.

Current Progress

Presently, the first three stages have been completed. The study is currently in the fourth (modification) stage. Snapshots of the portal page, article types, article text, and a checkpoint question are shown in Figures 1 to 4.



Figure 1. The portal page



Figure 2. Four article types

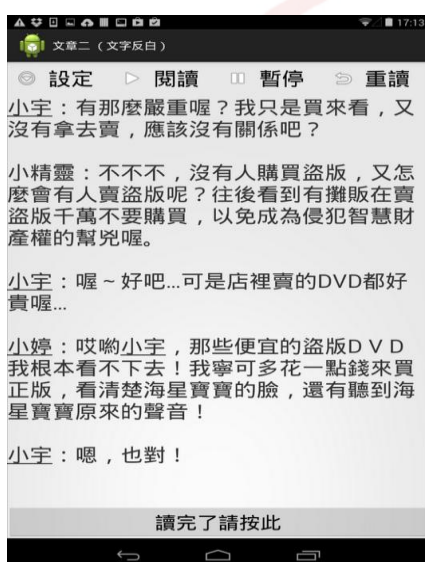


Figure 3. An article text

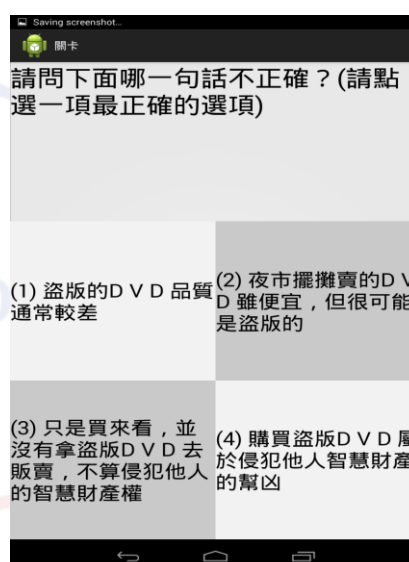


Figure 4. A checkpoint question

Eight RD students participated in the pilot test, with two engaging in individual reading and the other six conducting paired reading. Based on the students' test results and observation data, there are several areas in the reading interfaces needed to be enhanced. Some major revisions include adding phonetics to all Chinese characters displayed, making option buttons more salient, shortening the article length from 500 plus words to below 350 words, showing the article character by character only when highlighted, rather than displaying the entire content first and then highlighting the character one by one, and replacing one of the display modes with a new, more helpful mode. More specifically, the mode with text embedded with key phrase explanations is deleted, and a new mode with plain audio without text will be added. The modification is expected to be completed by the end of May. The final implementation will take place in June.

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How to Strengthen Teacher Education Experiences using Web 2.0 Technologies as Instruments to Enhance Learning

Gregory Powell, La Trobe University, Australia

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Abstract

This article provides insights into the use of Web 2.0 technologies from a personal perspective of an Australian education academic preparing the next generation of teachers at a higher education institution in Victoria Australia in digital and design technologies. The presentation will provide examples of the use of Web 2.0 technologies used by students to create, build, reflect, play and collaborate across a range of higher education subjects on offer for pre-service teachers that build knowledge, promote active and engaged learning, increase learner independence and tailor such learning to the individual needs of learners for the twenty first century. There are implications for any higher education institution involved with pre-service teachers in the teaching of a range of curriculum and the use of Web 2.0 technologies.

Keywords: Information and Communication Technologies (ICT), teachers, higher education, pre-service teachers (students training to be teachers), Science and Mathematics, Web 2.0 technologies, Challenge Based Learning, design principles

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Twenty First Century Education

Education is facing one of the largest transformations with globalization, knowledge economies and technical changes reshaping the world. As Fitzgerald (2014) states: “Pushing universities to seek new ways to reinvent themselves” (p.7). Education in the twenty first century is about working with people and by people, supporting the development of personalised learning with innovations associated with inventing new teaching practices using up-to-date technologies in creative ways. There are co-construction pathways between learners and educators developing ambitious and radical innovative environments and this to me is the future for all education systems worldwide. The emphasis is upon transferable skills where the learners are demanding improved access and outcomes and where the world economies are demanding new twenty first century skills.

This changing digital landscape needs to build on the increasing and wide ranging experiences in the use of digital technologies where higher educational institutions are obliged to focus upon and provide students with technology integration skills. As Banas and York (2014) state, “should focus not only on developing preservice teachers’ technology integration skills, but also provide them with the skills to navigate new technologies” (p.741).

These fundamental innovative changes occurring in the learning experiences offered by educational settings can be seen in how the modern student interacts, receives and responds to learning experiences in new and dynamic ways with an increased emphasis on transferable skills, situated learning (Lave & Wenger, 1991), communities of practice (Wenger & Snyder, 2000), critical thinking and critical reflection. As Nykvist (2008) states, “Students who use them will soon be the majority of students in the classroom” (pp 167-168). The goal for all of us involved in education is to build future practice better than we have used in the past.

A rethinking of educational approaches more broadly and the effective and relevant use of ICT is required particularly at Universities (Cuban, 1993). As Hedberg, Oliver, Harper, et al, (2002) contend new technologies provide rich experiences and can be effectively applied in teaching and learning for the twenty first century. Understanding the nature of these Web 2.0 tools and the possibilities they afford users becomes paramount to the twenty first century communities (Nykvist, 2008) and (Yang, 2006).

The development of Web 2.0 technologies has provided opportunities for users to engage in online discussion and creative design, beyond the walls of lecture theatres and tutorial rooms providing increased collaboration and interaction between individuals and groups. As Lamb & Groom (2010) state, “Without much effort, online teachers and learners can quickly assemble dynamic, networked personal learning environments simply by adopting the most popular tools in any particular domain. Having signed up for a Gmail account, a user can publish websites with Blogger, manage groups and mailing lists with Google Groups, videoconference with Google Talk, write collaboratively with Google Docs, track topics with Google Alerts, manage syndicated feeds with Google Reader, share video with YouTube, post images with Picasa, and do whatever it is that Google Wave is supposed to do. We need not belabor the power and popularity of services such as Flickr, Facebook, and

Twitter. All this incredible functionality is delivered in remarkably stable and user-friendly environments, and it's available free of charge!" (<http://www.educause.edu/ero/article/never-mind-edupunks-or-great-web-20-swindle>) Web 2.0 users are able to engage, collaborate, interact, innovate, build and reflect on their learning and the learning of others in ways thought unimaginable 20 years ago. As Johnson, et al (2014) affirm, "the use of digital content has become commonplace and the growing awareness of its importance is an important driver of decisions" (p.3). And as such teachers need to have broad understandings associated with the use of Web 2.0 technologies as well as equity, inclusion, and ethical conduct associated with their use in order to build future practices better than we have used in the past.

The important characteristics for twenty first century learning include: critical thinking, problem solving, innovation, collaboration, information, media, a range of technologies, innovative teaching and learning methods supported and enabled by collaborative technologies, as well as key system reforms by governments and other agencies. These characteristics provide strong and relevant connections that prepare learners for a world in which collaboration and change are ever present (Bennett & Maton, 2010, Maloney, 2007; Alexander, 2006; Harris, 2006; Warlick, 2006).

The learning experiences relevant for the twenty first century should be project based, reflect real world complex problems to be solved, be interdisciplinary, and personalized.

"In this interconnected world, with ubiquitous access to powerful technology and access to a worldwide community, new models of teaching and learning are possible" (ACOT, 2011).

The Nature of Web 2.0 Technologies

The term Web 2.0 was coined by Darcy DiNucci in 1999 in her article titled *Fragmented Future* "The web we know...is only an embryo of the web to come" (p.32). Although the concept of Web 2.0 began with a conference brainstorming session between O'Reilly and MediaLive International (O'Reilly, 2005).

Web 2.0 technologies describe a variety of applications and websites that provide users with the ability to create, share, collaborate and communicate information in an online environment "with greater ease that was previously available" Nykvist (2008, p. 167). The capability of such technologies comes from the fact that users do not require any Information and Communication Technologies (ICT) web design or web publishing skills to participate. Most new forms of Web 2.0 technologies come with mini training modules and thousands of instructional video clips can be found on YouTube making it easy for users to create and publish for a worldwide audience. Although some critics argue that this is the major weakness of Web 2.0 technologies in, "that it is too easy for the average person to affect online content and that, as a result, the credibility, ethics and even legality of web content could suffer" (Rouse, 2014). Regardless of such criticisms Web 2.0 technologies have become the norm for many users in the twenty first century.

Web 2.0 technologies afford pre-service teachers with ICT capacity for inquiry, creativity, research, communication, competition and collaboration to construct new learning and insights that are accurate, authentic and relevant to the twenty first

century learners. Solutions to issues or problems identified are researched, evaluated, redesigned, reflected upon, linked to curricula and targeted at both local and global audiences. Educational content can be delivered via Web 2.0 technologies that provide for multimedia and multimodality to suit a range of learning styles, differing abilities and even alternative formats for students with disabilities. The social interactions among learners play a crucial role in the processes of learning and cognition (Vygotsky, 1978). It is the participatory nature that Web 2.0 technologies afford that Cognitive tools such as Web 2.0 technologies provide a vision of what future learning environments should be like (Kim & Reeves, 2007). When linked to social constructivist learning approaches (i.e. authentic pedagogy) and real world issues learners (i.e. pre-service teachers) are being prepared for the “messiness” of the twenty first century workplace (Lombardi, 2007, p.3).

The Use of Web 2.0 Technologies in Pre-Service Teacher Education

Researchers into ICT use in education, such as Turkle (1984), Papert (1980) and Yelland, Neal and Dakich (2008), as well as Dede (2009) argue that students construct reality from their own lived experiences and prior knowledge. The ICT tools (i.e. websites and Web 2.0 technologies) utilised by students today provide an authentic context for learning through investigating, communicating and creating with ICT (<http://www.education.vic.gov.au/school/teachers/support/Pages/planning.aspx>). “The context in which digital technology is deployed needs to change if we are going to drive better educational outcomes” (Nesta 2013).

Technology is an ever present reality in the lives of twenty first century students and to be relevant such tools need to be digital. “Outside of the formal educational setting, students have access to high quality games, which incorporate high levels of interactivity and a multitude of pathways and levels of difficulty” (Gregory, S. et al, 2014, p.286).

The use of Web 2.0 technologies provides for active participation by students in their own learning through doing rather than passively listening and reading (Levin & Alexander, 2008), (Collins & Halverson, 2009) and (Gaffer, Singh, & Thomas, 2011). The use of technologies provide opportunities for pre-service teachers to create, play, design, trial, reflect and explore educational ideas associated with curriculum content. The use of ePortfolios, WebBlogs and Wikis, for example, affords opportunities for collaboration, reflection, innovation, creativity, and design in an online format. Knowledge is built, learning is active and assessments (using Rubrics) are easily built into tasks promoting authenticity. Engagement, motivation and challenge are provided through the use of Web 2.0 technologies. Multimedia, interactivity and communication between users reflecting upon their higher educational learning experiences helps to provide a more positive attitude towards their own learning.

Web 2.0 technologies incorporate the principles of Universal Design for Learning (UDL) providing educators with creative, flexible and innovative pathways that accommodate the learning needs of students. The acquisition of new knowledge is enabled through the use of Web 2.0 technologies providing multiple directions and a flexible means for student voice in the use of text, images, designs, music, and video. The UDL principles of creativity, collaboration, exploration and interactivity are also enhanced (CAST, 2011).

For pre-service teachers the author encourages a multidisciplinary approach across a range of technologies used in their daily lives to solve real world issues.

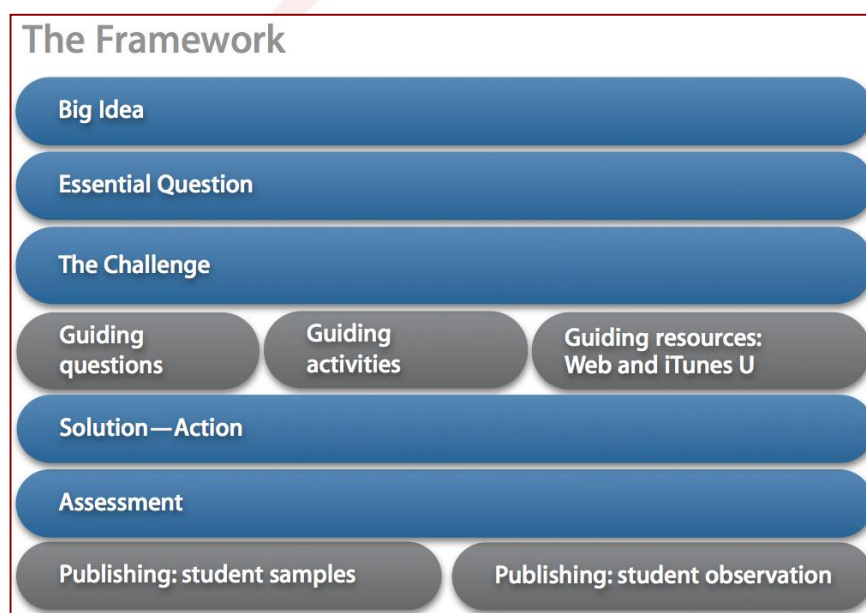
Collectively this is known as Challenge Based Learning (CBL).

“Challenge based learning is a collaborative learning experience in which teachers and students work together to learn about compelling issues, propose solutions to real problems, and take action. The approach asks students to reflect on their learning and the impact of their actions, and publish their solutions to a worldwide audience” (Johnson & Adams, 2011, p. 4).

Challenge Based Learning and Web 2.0 Technologies

The framework for Challenge Based Learning (CBL) begins with a big idea, followed by an essential question, a challenge, guiding questions, activities, resources, providing solutions through action based on reflection, assessment and finally publishing to a wider audience (ACOT, 2009).

Figure 1: Framework for Challenge Based Learning:



ACOT (2009). p. 2. http://ali.apple.com/cbl/global/files/CBL_Paper.pdf

Web 2.0 technologies provide an extensive range of applications to assist such inquiry with the CBL framework requiring pre-service teachers working collaboratively in small groups, having 24/7 access to technology and mentoring from lecturers. Assessment Rubrics are established to support the investigation and formal assessments can be incorporated into the process. Ongoing research and individual and team reflection into the issue are essential. With the proliferation of Web 2.0 technologies pre-service teachers are provided with multiple means of representation and publishing to a worldwide audience. The issue selected and the inquiry process based on research by the teams are linked to the Australian Curriculum and specifically for Victorian schools, the AusVELS.

“AusVELS is the Foundation to Year 10 curriculum that provides a single, coherent and comprehensive set of prescribed content and common achievement standards,

which schools use to plan student learning programs, assess student progress and report to parents” (VCAA, 2014).

Up until two years ago at La Trobe University (School of Education) such CBL inquiry was referred to as a Webquest. An online example of such a Webquest as an integrated unit of study by Allinson and Egan (2012) based on Refugees can be found online at: <http://webquests.wix.com/refugeeswebques#!>

Over the last two years the decision was made to change this to iQuest (rather than Webquest) as it resonated better with newer technologies available and reminded the pre-service teachers that the process was one of inquiry.

Over the past twelve years of undergraduate and post-graduate courses (across two Universities) the author used an extensive range of technologies from software packages such as MS Word, MS Publisher, MS PowerPoint, Inspiration, Adobe Photoshop, Photo Story for Windows, Blackboard (Moodle), PebblePad to the use of Web 2.0 technologies and innovative websites such as Blogs, Wikis, Weblogs, Voice Threads, Wix, GoAnimate, Wordle & Tagxedo, Make Believe Comix, DeVolver Movie Maker, Prezi, Vimeo, Storybird, Voki, Zooburst, BuildYourWildSelf, Delicious, ToonDoo, Scootle, ABC Splash, and FUSE.

Most assessment tasks within educational subjects at La Trobe University (School of Education) require reflection, research, inquiry, communication, collaboration, and creation. PebblePad™ is used extensively as an eResource providing a creative eportfolio portal for pre-service teachers in curriculum such as Science, Mathematics, English, Professional Practice, Research, Multimedia and ICT. Allied to this is the university's use of Blackboard Moodle as a Learning Management system. Both systems provide users with a plethora of resources including hyperlinks to online and blended learning modules and have provision for uploading of assignments for sharing among the student population. The CBL inquiries developed by pre-service teachers are ably supported through the use of these forms of Learning Management systems.

Pre-Service Teachers Use of Web 2.0 Technologies at La Trobe University

Across a range of subjects in both undergraduate and post graduate degrees La Trobe University pre-service teachers within the School of Education are exposed to a range of Web 2.0 technologies and provision for assessments using such technologies is inbuilt into subject learning guides. Rubrics are developed to provide assistance to the pre-service teachers as they reflect, build, develop and experiment with Web 2.0 technologies they have selected (Carlson & Jesseman, (2011). The introduction to Web 2.0 technologies has provided new ways of presenting information and ideas in interactive ways unfathomable twenty years ago where essays and written examinations were the main forms of assessment for most university subjects.

Today the pre-service teachers can upload digital content created within collaborative small teams as well as individually to such websites as: Flickr, Vimeo, PebblePad, Moodle, Presi, Go Animate, as well as a range of WIKIs, and Blogs. Students can upload the content from lecture theatres, tutorial rooms, computer laboratories, their own homes, libraries as well as any establishment offering free Wi-Fi. The sharing of

such digital content can be limited to members of specific online groups, or delivered to a global audience utilising such sites as Google Blogspot, Vimeo and Flickr.

Examples include: a Science experiment videoed as part of EDU4PST subject and uploaded to Vimeo: <https://vimeo.com/40807341> as well as a Design Brief application involving materials technologies: <https://vimeo.com/40493898> both by pre-service teacher Brendan Wardlaw (2013). Pre-service teachers are presented with a Design Brief and all physical materials they require to solve the problem of 'How to Make a Frog Jump'. As they work in pairs through the Design Brief three step process (Investigate/Design, Produce, Analyse /Evaluate = ID/P/AE) pre-service teachers create solutions to the problem posed. Each pair reports back to the whole workshop cohort and demonstrates their designs. Videos are made of the jumping frog and then uploaded to Vimeo by each student pair (understandings based on this process for Victorian education based upon AusVELS curriculum material can be found at: <http://www.vcaa.vic.edu.au/Documents/auscurric/progressionpoints/DCTProgressionPoints.pdf>).

Other examples of Web 2.0 technologies used for inquiry and reflection at La Trobe University (School of Education) by two pre-service teachers Kym Barbary and Lianne de Jong developed after a three day intensive can be found here: <http://reflectionkbarbaryedu4uml.blogspot.com.au/> and <http://www.uml-lisannedejong.blogspot.com.au/>. These Blogs demonstrate a creative use of Web 2.0 technologies (i.e. Google Blogspot) based upon student reflections including the use of other Web 2.0 technologies, software used in workshops, lectures and workshop content. The power afforded by Web 2.0 technologies and the educational impact realised by pre-service teachers when using such software for a global audience enhances their ICT understandings as well as the notion of online communities of practice. The inquiry, the creation and communication based on the use of Web 2.0 technologies enable collaboration, research practice, independence and the construct of new learning. Pre-service teachers have ownership in the development of creative solutions based on the content studied and are able to apply a range of design processes that combine media elements for a solution suitable to both the requirements of the subjects studied at University and their own personal needs. There is also an element of experimentation and choice in generating such creative ICT solutions. However there are many ethical and moral issues associated with the creation of such online Reflective Blogs (e.g. individual rights, cultural expectations, copyright, and protection of electronic information as well as the impact of such globally assessed ICT materials by others). And it's partly the responsibility of academics at universities to remind as well as inform pre-service teachers of their responsibilities in this regard. The use of Web 2.0 technologies as tools for educational use in the twenty first century enables pre-service teachers to develop new ways of thinking, inform others worldwide through personal reflection and feedback as well as providing creative and innovative pathways for their teaching practices.

Recommendations for Practice

Promoting the goals of excellence and equity has to be at the heart of every Higher Educational Institution enabling students to become successful, confident and creative learners so that they can become active and informed citizens. The goals and

outcomes can be delivered through, “New technology-based models of learning” and a variety of educational tools such as Web 2.0 technologies (Deed, 2013, p. 48). Subsequently, students are provided with a digital voice to choose from a range of Web 2.0 technologies to assist their learning as well as for assessment purposes across a range of disciplines.

But such outcomes can only be achieved when academics provide their students with opportunities for authentic learning incorporating real life experiences utilising the tools of Web 2.0 technologies and the CBL models (discussed above). As, “... without skilled and effective staff conducting teaching in new ways, student learning is less likely to be as successful as it might be” (Jeffrey et al, 2012). Academics must see themselves as co-learners in the educational process through learning by doing. They need to create real world educational learning environments that merge both formal and non-formal learning to foster creativity, curiosity, and experimentation in twenty first century students. New forms of assessments based upon the use of Web 2.0 technologies can be captured through rubrics that incorporate collaboration, interdisciplinary learning, student peer assessments as well as self-assessments, and the quality of learning that achieve professional teacher standards. As Tsai (2009) states, “conceptions of web-based learning were often more sophisticated than those of learning in general” (sec. 4, para. 2).

However such recommendations can only be fostered through the provision of professional learning for academics in the use of digital technologies by Higher Educational institutions across a range of disciplines and literacies. Opportunities for academics to familiarise themselves as well as practise using such Web 2.0 technologies is important. For as familiarity with using such technologies increases, the attention to learning and engagement, with pre-service teachers comes to the forefront. As Hattie (2008) affirms, teachers are the “most powerful influences in learning” (p. 238).

Conclusion

The use and significance of Web 2.0 technologies in education for pre-service teachers lies with the affordances they provide (i.e. networking, collaboration, communities of practice, editing, writing, reflecting, and the sharing of knowledge, ideas and opinions). It is incumbent upon academics to be aware of such affordances to support effective teaching and learning within Universities and Higher Educational Institutions. More importantly the use of Web 2.0 technologies must be based on sound pedagogy that is aligned to the course and subject learning objectives, instructional strategies and assessment methods used. In this presentation, I have provided a background to Web 2.0 technologies, discussed the limitations that exist in their use, as well as the practical implications and recommendations for practice of their use by education pre-service teachers through the online examples shown above. The author has also pointed out the importance of professional learning opportunities for academics in using Web 2.0 technologies to familiarise themselves with these tools so that students entering our Universities and Higher Educational Institutions can be engaged in the learning experiences. To strengthen and enhance teacher education experiences Web 2.0 technologies provide new and powerful learning opportunities for pre-service teachers that are authentic and challenging for the twenty first century.

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The logo for the International Association for Online Learning (iafor) is centered on the page. It features the word "iafor" in a lowercase, sans-serif font. The text is surrounded by several overlapping, curved lines in shades of blue and red, creating a circular, dynamic effect.

Improving Children's Cognitive Modifiability by Dynamic Assessment in 3D Immersive Virtual Reality Environments

David Passig, Bar-Ilan University, Israel
David Tzuriel, Bar-Ilan University, Israel
Ganit Eshel-Kedmi, Bar-Ilan University, Israel

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Abstract

Increasing evidence reveals the efficacy of dynamic assessment procedure (DA) in providing rich and reliable feedback regarding children's cognitive modifiability. Children's cognitive modifiability was examined using DA in two computerized environments: 3D Immersive virtual reality (3D IVR) and 2D. Children in grades 1 and 2 (n =117) were randomly assigned into three experimental groups and one control group. Each of the experimental groups was taught in a different modality: 3D IVR (n = 36), 2D (n = 36), and tangible blocks (n = 24). The control group (n=21) was not given teaching phase. The teaching phase included strategies of solving analogies from the *Analogies* subtest of the *Cognitive Modifiability Battery* (CMB) using the specific modality, respectively. Pre- and post-teaching Analogies tests were administered to all groups. The findings indicate that teaching in a 3D IVR contributed to the children's cognitive modifiability more than in the other groups. We found significant differences between the control group and all the other groups as well as a significant difference between pre-and post-teaching in the experimental groups. However, there was a significantly greater improvement in the analogical thinking achievements, in a 3D IVR environment than in the computerized 2D and the non-computerized tangible blocks groups. These findings indicate that children experiencing a DA procedure in a 3D IVR environment demonstrate a significantly higher learning potential than children who experienced the combination of DA procedure with other formats of teaching environments.

Keywords: dynamic assessment, mediated learning strategies, cognitive modifiability, analogical thinking, virtual reality.

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Introduction

Cognitive modifiability

Many studies were conducted using a dynamic assessment (DA) procedure with children at early age in order to establish the validity of DA tools, and to prove their efficacy as predictive instruments of learning ability (e.g., Carlson & Wiedl, 1992; Guthke & Wingengeld, 1992; Guthke, 1993; Resing, 1997; Hessels, 2000; Tzuriel, 2001; Sternberg & Grigorenko, 2002; Wiedl, 2003; Haywood & Lidz, 2007). The DA procedure involves a teaching procedure in between a pre- and post-teaching phase. Very few studies however focused on examining the efficacy of the DA procedure in a computerized environment (e.g., Tzuriel & Shamir, 2002). Our main objective was to study the degree to which the learning process in a DA and a 3D immersive virtual reality (3D IVR) framework would contribute differentially to cognitive modifiability of children. We examined the impact of 3D IVR in a DA procedure on the cognitive modifiability while learning analogical problem solving. We hypothesized that cognitive modifiability would be the highest in children who participated in a 3D IVR followed in that order by 2D computerized environment, tangible blocks non-computerized environment, and the control group.

This study was guided by a number of theories regarding factors affecting children's analogical reasoning development. The first is the *Structural Cognitive Modifiability (SCM) and the Mediated Learning Experience (MLE)* theory (Feuerstein, Haywood, Rand & Hoffman, 1979; Feuerstein, Rand, Hoffman & Miler, 1980) from which the DA approach is derived.

According to this theory, the main factors which affect individual differences in children's cognitive development are distal and proximal factors (Feuerstein, et al., 1979, 1980). The distal factors include, among others, hereditary and environmental factors whose effect on the development is indirect. The proximal factors are *mediated learning experiences* (MLE) to which children are exposed to while interacting with parents and teachers. MLE processes describe a special quality of interaction between a mediator and a learner (Feuerstein, et al., 1979; Tzuriel, 2000, 2001, 2013). In this qualitative interactional process, parents or substitute adults or peers interpose themselves between a set of stimuli and the developing child (learner) and modify the stimuli for him/her (Tzuriel, 2000, 2001). MLE processes are considered as the proximal factor that explains cognitive modifiability. *Cognitive modifiability* is defined as the individual's propensity to learn from new experiences and learning opportunities and to change one's own cognitive structures.

According to the SCM and MLE theory, intelligence is defined by the individual's ability to change itself, and to use the principles and behavior models it studied in the past for the sake of adapting to new conditions. Cognitive modifiability, with the help of MLE is considered to lead to change in the expected course of the individual's development. The concept of cognitive modifiability refers to structural change brought about with the help of intervention which guides the individual's absorption of external stimuli (Lidz, 1991; Tzuriel, 2000). Based on this theory, it is impossible to estimate learning potential on the basis of previous learning experiences, or on the basis of the final product of those learning experiences (achievements). The emphasis

must be placed on the learning process by itself and on the assessment of the individual's ability to modify intelligence.

Method

Participants

A group of 117 children (61 boys and 56 girls) were randomly drawn from first and second grades from two elementary schools to participate in this study. The children's age range was between 72 to 102 months ($M = 90.00$, $SD = 6.88$). Children diagnosed as having learning difficulties were not included in the research. All children were assigned randomly into four groups of the study with somewhat greater number

In recruiting the participants we asked first for parental consent. Out of 167 parents 127 gave their consent. Ten children dropped out of the study at the beginning of the DA procedure, because of lack of interest, despite their parents' consent. The number of boys and girls in each of the study's subgroups is presented in Table 1.

Gender composition in each subgroup did not reveal significant differences $\chi^2 = .75$, $df = 1$, *ns*. The age of children and parents years of education in the four groups is presented in Table 2. Significant group differences were found only in father's years of education.

Table 1. Number of Boys and Girls in the Sample

Group	Boys		Girls	
	N	%	N	%
1. 3D IVR	19	52.6	17	47.4
2. 2D	21	58.3	15	41.7
3. Tangible Blocks	12	50.0	12	50.0
4. Control	9	42.9	12	57.1
Total	61	52.1	56	47.9

Table 2. Parents age and education in the Four Groups of the Study.

		3D-IVR	2D	Tangible Blocks	Control	F(3,113)	Eta ²
Age	M	92.30	88.89	88.66	88.23	2.59	.06
	SD	6.08	7.21	6.12	6.79	-	-
Father's years of education	M	16.94	16.91	14.91	15.42	3.26*	.08
	SD	3.38	2.81	3.06	2.83	-	-
Mother's years of education	M	16.56	16.19	15.42	16.19	1.09	.03
	SD	2.26	2.57	2.65	1.99	-	-

- $p < .05$

Scheffe's analysis revealed significant difference only between the Tangible group that used wooden blocks to study analogies and the 3D-IVR group. It should be noted that since the focus of this study was on DA in a computerized environment; the groups assessed through the computer were larger than the other two groups.

Measures

Analogies Subtest from the Cognitive Modifiability Battery (CMB-AN)

For this study we developed two computerized versions of the CMB-AN: a 2D computerized mode (using a mouse and screen interface) and a 3D computerized mode (3D IVR interface). The goal of this test was to assess young children's cognitive modifiability in the analogical reasoning domain. The CMB-AN was designed for children in the age range of kindergarten to fourth grade, but also suitable for children with learning difficulties in the fifth through eighth grades. The diagnostic procedure is based on Feuerstein's theory of mediated learning experience (Feuerstein et. al., 1980).

The CMB-AN subtest includes a preliminary-baseline stage aimed at preparing the child for testing. The preparation is done by acquainting the child with the test dimensions and with the basic rules for solving problems. The test is constructed of a wooden board (18cm x 18cm) which includes 9 windows set in a 3 x 3 format, and 64 wooden blocks in four colors (yellow, blue, red and green). For each color there are blocks in four heights (2cm, 3cm, 4cm and 5cm). The examiner places the blocks in three open windows (top-left, top-right, bottom-left) and the child has to complete the last open window (bottom-right) (see Figure 1). The child is encouraged to solve the problems both horizontally and vertically. The problems are presented to the examiner in a booklet of problems.

The CMB-AN subtest includes two sections: Test problems (14 items) and Transfer problems (9 items). In both, the problems include three parallel items for pre-teaching, teaching, and post-teaching. The goal of the Transfer problems is to assess the degree of internalization of the analogy principles taught in the Test section. All problems in the CMB-AN subtest are based on dimensions of color, height, number and location (See Figures 1 and 2). The Test problems are constructed from three levels of difficulty, derived from the number of dimensions included in the problem and arranged from easy to difficult. The dimension of location is considered to be the most difficult of all.

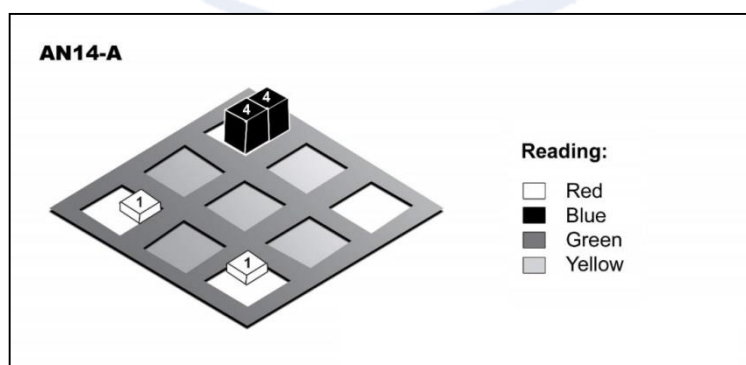


Figure 1. Example of Analogy problem from the CMB-Analogies Subtest (AN14-A) (by permission of David Tzurriel)

The Transfer problems are more complex in terms of the number of dimensions (color, height, number, and location) and the degree of abstraction required. In the

present study we administered the Transfer problems according to the static approach. An example of a Transfer problem (TR8-A) is demonstrated in Figure 2.

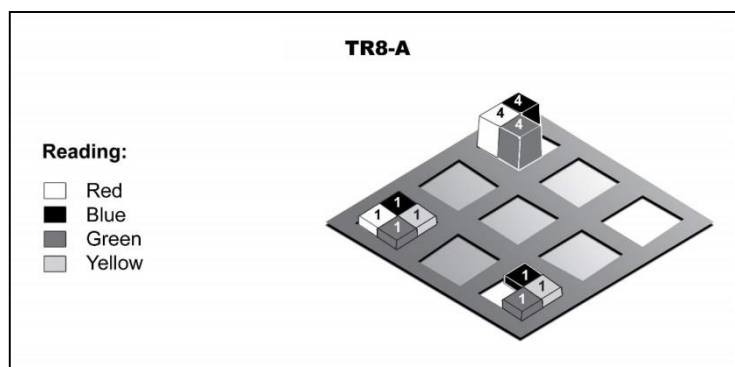


Figure 2. Example of a Transfer problem from the CMB Analogies Subtest (TR8-A).
(by permission of David Tzuriel)

The test section is carried out with pre-teaching, teaching and post-teaching stages, thus, enabling assessment of the child's cognitive modifiability. In the original administration each problem is laid out on the board in three open windows and the child has to complete the last open window by choosing the correct blocks from a pile of blocks (see Figure 1). In the pre- and post-teaching phases no mediation is provided, except for giving instructions, as needed, or light probing (e.g., “look in both directions”, “don't rush”, “check your answer one more time”). In the teaching phase the child is taught to look for the relevant dimensions of the problem, develop a systematic exploratory behavior, acquire need for accuracy, understand the transformation rules of analogy, and improve performance efficiency. The mediation strategies include also non-verbal focusing, labeling, verbal anticipation of correct answer, and “rhythmic intonation” of contents.

Two main approaches may be used in teaching analogies: analytic and transformative. According to the analytic approach, each dimension is analyzed separately followed by integration of all dimensions. The examiner might sometimes use animation (“the big red block here is a friend of the big yellow block”). According to the transformative approach, the examiner teaches the child the rules of transforming relations between blocks (“on the top side the red block changes from red to green, but the height, number and location remain the same, so also in the bottom side the red block should change from red to green and the rest of the dimensions remain the same”). In the current study, we used both approaches interchangeably. Scoring was carried out only for the pre- and post-teaching phases and the improvement. The pre- and post-teaching scores served for the analysis of the child's cognitive modifiability. Scoring was carried out by the all or none method and the partial credit method (Tzuriel, 2000). In this method, a score of 1 is given for each correctly solved dimension. The total number of scores was 56 points (14 problems x 4 dimensions). Cronbach's alpha reliability coefficient of the original tangible format is .83 and .78 for pre- and post-teaching stages, respectively (Tzuriel, 2000).

Computerized CMB-Analogies (CMB-AN) test

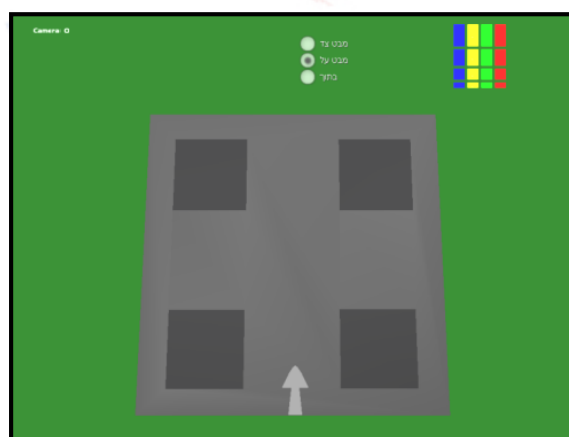
For this study we developed a computerized version of the CMB-AN test in order to be able to run it as a 2D multimedia computer application using a mouse and screen interface as well as a 3D Immersive Virtual Reality world using a Head Mounted Display interface (HMD) (Figure 3).

We conducted a pilot study in order to test the suitability of the hardware and software for young children use. Following the pilot study we improved the instruments, and added an introductory stage to familiarize the children with the HMD and the 3D environment (e.g., up, down, left, right and rotation). The introductory stage was designed to take 10 minutes, and included the following elements: orientation in the 3D IVR environment, acquaintance with and adjustment to the HMD interface, exercising selection of blocks from a repository and manipulating their location on the digital board, and exercising moves and other features in the virtual environment with a mouse while the HMD is on the subject's head (Figure 3).



Figure 3. A child during a DA procedure wearing an HMD

Virtual worlds



The first screen from which the DA procedure began included a grey, flat, square board with black squares painted on its four sides (hereafter, windows).

Figure 4. The opening screen to the computerized virtual world in the 2D and 3D IVR environments.

In three windows (i.e., top-left, top-right, bottom-right) are representations of the colored wooden blocks, as dictated in each problem. In the front part of the board was a picture of a wooden arrow, which served as a permanent reference point to the front of the problem (the side closest to the child, on the bottom of the screen), and to its opening (Figure 4). Each screen included a storage bin of the represented blocks located on the upper-right side of the screen in four colors (blue, green, red and yellow) that were arranged side by side by height (from highest to lowest; total of 16 blocks). The original storehouse of the original test included 64 blocks. In order not to clutter the virtual reality world with so many blocks we designed a feature that by pressing on the right block in the storehouse, the participant received 4 other blocks of the same color.

The computer application made it possible to observe the problem from three angles: *top*, *side*, and *within* (imagining a situation in which the child being examined is standing in the center of the board and is looking around). The starting point was the top angle. We placed three buttons in the upper center of the screen, and by pressing any one of them one could shift from one to any other angle of observation on the problem. In addition, the computer program was designed so that it would be possible to make the problem turn on a 360° horizontal axis (which enables observation from several points of view) and at an angle of 45° on a vertical (up and down) axis. In Figure 5 there is an example of an analogical problem from different angles: top, front, within and 180° rotation.

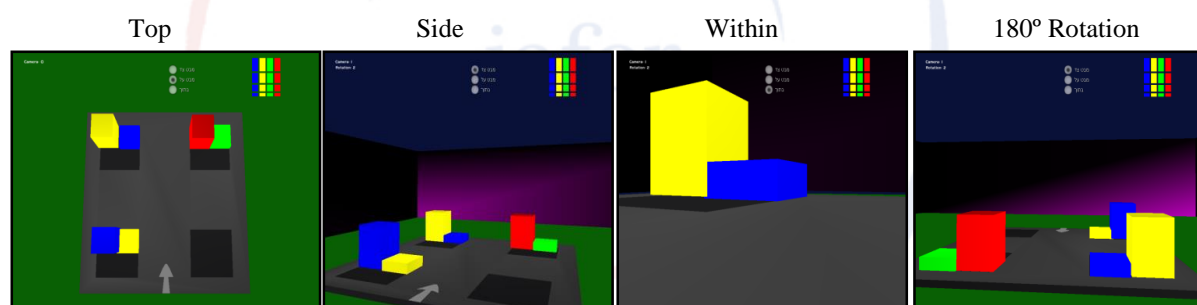


Figure 5. Representation of a problem (TR2-B) in a virtual board as seen from different angles.

Procedure

This study included two measurements that were administered two weeks apart. The first measurement included a DA of analogical thinking (pre-teaching, teaching, and post-teaching) followed by administration of the Intrinsic Motivation Scale. The DA was performed in a small quiet room assigned by the school; only one child was assessed at a time. The DA procedure included pre-teaching (30 minutes), teaching (30 minutes), and post-teaching (30 minutes) stages. A 5-minutes break was given between the stages. Many of the children enjoyed participating in the DA procedure and wanted to stay at the room and continue with the procedure during the break. Before starting the assessment, the examiner introduced himself/herself to the child and led the child through some warm-up exercises to familiarize him/her with the DA tools, concepts (height, number, color, location) and problem solving rules based on to the CMB guidelines (Tzuriel, 1995). In the 2D and 3D computerized environments, the examiner explained the mouse-screen interface, and introduced the child to the

buttons which enable movement. The examiner also explained how to use the Head Mounted Display (HMD), how to move and orient oneself in the 3D IVR space. Some more time was given to adjust the HMD to the child, showing her/him how it enables immersion in the virtual space. In the control group, the examiner demonstrated to each child, individually, the solution of a sample problem before administering the pre-teaching test; no teaching stage was given before the post-teaching test. It is important to point out that the teaching stage was similar in all the experimental groups; the mediation strategies that the examiner monitored throughout the procedure with each child in all the experimental groups were similar. An attempt was made that examiners will give more or less equivalent level of mediation, so that the main difference between the groups would remain solely the learning environment (blocks, 2D and 3D IVR).

The second measurement was the Transfer problems of the CMB-AN, which contain more difficult items (see Measures). The Transfer test was conducted with all groups individually using a standardized assessment procedure with a tangible board and blocks. The assessment was conducted in the allocated small room. The administration of the Transfer problems two weeks after the testing phase was carried out to control the memory effects and ensure that performance reflects internalization of the analogical reasoning. Thus, the Transfer phase was different from the Testing problems not only in terms of the nature of problems but also in terms of the time passed from the initial Test phase. The second measurement was administered by a standardized way, i.e., without a teaching stage. Following is a detailed description of the results of these stages.

Results

Cognitive modifiability in the four groups of the study

The DA procedure yielded two main scores: Pre-teaching and post-teaching, each was based on sum score of the dimensions of color, height, number, and location. In addition, each dimension was scored separately. The range of scores in each dimension was 0-14 and the total score was 0-56. Cognitive modifiability is indicated by the level of improvement from pre- to post-teaching.

In order to examine initial differences among groups we carried out a one-way ANOVA of Group where the dependent variable was the CMB-AN pre-teaching score. The analysis revealed no significant Group main effect, $F(3,113) = 1.64$, *ns*.

A repeated measures MANOVA of Group x Time (2 x 2) revealed a significant Time main effect $F(1,113) = 241.77$; $P < .001$, $\eta^2 = .68$, indicating an improvement from pre- to post-teaching. The means and standard deviations of pre- and post-teaching scores as well as the Group x Time interaction are presented in Table 3. The interaction is presented in Figure 6.

Table 3: Means, standard deviations, and F statistics of the four groups in CMB-AN in pre- and post-teaching stages of the DA procedure.

Groups	3D-IVR		2D		Tangible Blocks		Control		Group X Time	Eta ²
	Pre	Post	Pre	Post	Pre	Post	Pre	Post		
M	2.58	10.72	4.02	9.75	4.70	10.45	4.00	4.19	25.18***	.40
SD	3.27	3.89	3.36	2.87	4.49	3.20	4.42	3.57		

*** $p < .001$

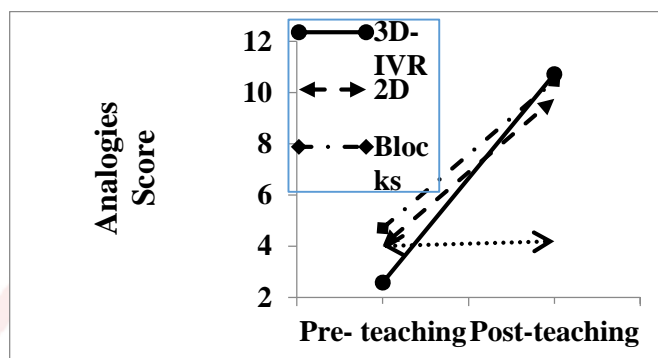


Figure 6: CMB-AN pre- and post-teaching scores in the four study’s groups.

As can be seen in Table 3 and Figure 6, the three experimental groups improved their performance from pre- to post- teaching whereas the control group showed no improvement.

Variance analysis (Table 4) was carried out where post-teaching scores were the dependent variable and the pre-teaching scores the variant variable. The findings revealed that the control group, as expected, showed lower scores than each of the three experimental groups. The findings revealed also that the 3D IVR group scored significantly higher than the 2D group and the tangible blocks group. The findings support the research hypothesis, according to which the pre- and post-teaching improvement in analogical thinking are higher in the 3D IVR group than in the other experimental groups (2D and Tangible Blocks), and that all experimental groups will show higher improvement than the control group.

Table 4. Variance analysis for comparison between pairs of the study's groups (Group 1: 3D- IVR; Group 2: 2D; Group 3: Tangible Blocks; Group 4: Non computerized).

Group comparison	df	Mean	F	Eta ²
3>4	1,43	173.08	28.53***	.40
2>4	1,55	202.92	49.11***	.47
1>4	1,55	418.96	117.70***	.68
2=3	1,58	.006	.00	.00
1>3	1,58	41.08	5.88*	.09
1>2	1,70	52.56	9.89**	.12

* $p < .05$, ** $p < .01$, *** $p < .001$

Group Differences on the Transfer Analogies

In order to test the hypothesis on the Transfer test, we performed a one-way analysis of variance (ANOVA) where the independent variable was Group, the dependent variable was the score in the Transfer analogies. The findings showed a significant Group main effect, $F(3,113) = 17.34$, $p < .001$, $\eta^2 = .32$. The highest group was the 3D-IVR ($M = 5.32$, $SD = 2.47$) followed by the 2D ($M = 3.59$, $SD = 1.76$), Tangible Blocks ($M = 3.50$, $SD = 2.02$) and Control ($M = 1.47$, $SD = 1.20$). Post-hoc analysis using Scheffe's procedure ($p < .05$) indicated that the control group was the lowest and that the 3D IVR group scored higher than the 2D and Tangible Blocks groups. .

Discussion

The goal of this study was to examine the influences of a teaching process which takes place in a computerized dynamic assessment (DA) procedure and especially in 3D IVR on children's cognitive modifiability in the domain of analogical thinking. We asked whether a DA procedure, conducted in computerized environments, would better reflect the child's learning potential than a standardized tangible blocks situation.

This goal was based on a number of studies addressing the issue of developing thinking skills with computers (Dede, 2005), and on findings of various studies about mediated learning and DA with children (Tzurriel & Shamir, 2002, 2010). The first research objective was to test the impact of learning in a DA procedure on the cognitive modifiability of children's analogical thinking while the procedure is conducted in a 3D IVR environment as compared with computerized 2D and non-computerized tangible blocks environments. The MLE process was presented in a way which was similar in all of the teaching environments. We assumed that cognitive modifiability of children's analogical thinking in a DA in a 3D IVR environment would be higher than with a 2D computerized environment, a non-computerized environment or a control group. The second aim was to test the transfer effect of these three experimental situations on the children's analogical thinking performance of a more complex nature. Our hypothesis was that the transfer scores would be higher after teaching through a DA procedure in a 3D IVR environment.

Our findings supported our hypothesis, as can be seen in the analogies' pre- and post-teaching scores (Tables 3 and 4, and Figure 6). We found significant differences between the control group and all the other groups as well as a significant difference between pre-and post-teaching in the experimental groups. However, there was a significantly greater improvement in the analogical thinking achievements, in a 3D IVR environment than in the computerized 2D and the non-computerized tangible blocks groups.

These findings indicate that children experiencing a DA procedure in a 3D IVR environment demonstrate a significantly higher learning potential than children who experienced the combination of DA procedure with other formats of teaching environments. Similarly, our findings indicate that it is possible to conduct a DA procedure which includes mediated learning experience strategies in a 3D IVR computerized environment. Our findings are supported by findings of other 3D IVR studies (e. g., Passig & Miler, 2014) and add another important layer to the overall accumulation of evidence – it broadens their scope to include the areas of mediated learning and dynamic assessment.

One possible explanation for this lies in the manner in which one uses virtual reality. The improvement of cognitive skills stems from the possibilities embedded within this technology which presents abstract concepts through a concrete, visual, three dimensional experience. It is well established from earlier research, in the field of the development of analogical thinking in early childhood, that when analogies are presented to children by means which they are familiar with and which they deem concretely significant; they deal with them successfully (Goswami, 1992; Halford, 1993). The VR technology by nature expands the diverse ways in which information is presented, as well as assists young children in the course of the DA procedure to strengthen their ability to deduce analogical conclusions.

This study has shown that in the course of the DA procedure in a 3D IVR environment, the children's opportunities for gaining concrete experiences were enriched by means of exposure to new, additional information which is solely virtual. This virtual visual information presumably stimulated a unique perceptual experience which contributed to the creation of new and broadened internal images and of new schemes that enhanced the individual's ability to solve problems. When the children were requested to solve analogies; visual information which was absorbed directly beforehand, transferred, as the Dual Coding Theory suggests (Paivio, 1991) to perceptual information retrieved from the memory while addressing an analogy.

An additional possible explanation is connected to the children's cognitive development stage while solving analogical problems during the DA procedure. It is well established that children have difficulties characteristic of their stage in the development of analogical thinking. One prominent difficulty is their inability to embrace a number of relationships at the same time. It is possible that when assisted in observing a problem from the widest angle and perspective, actions facilitated by 3D IVR, they were better able to grasp the rules of transformation. With this improved tool in hand, they were better situated to make a methodical search for the blocks most appropriate for solving the analogy. Thus they improved their ability to think simultaneously along a number of dimensions which were in a constant state of transformation, to include them in the overall solution to the problem and to perform

better in amassing a greater quantity of achievements than those which added up by subjects in the other learning environments.

Yet another explanation for these findings could be associated with the geometric nature of the objects that are included in the virtual worlds simulated in this study. For example, in a study (Passig & Eden, 2002) in which the impact of practicing the rotation of geometric objects (several blocks attached to one another, creating an asymmetrical geometric object) on cognitive performance, there was an advantage among students who practiced rotation of the object in a 3D IVR environment. This was in contrast to the non-computerized environment. In this study, as well, it was found that the simulation of geometric blocks in a 3D IVR environment contributed to the understanding of the problem and to the subject's ability to solve it as opposed to other learning environments. In that sense, it is possible that the use of 3D geometric objects in a 3D IVR environment has a relative advantage over similar contents in other environments. We believe, however, that this aspect should be further examined in future studies in order to deepen our understanding of this advantage.

Summary

The findings of this research may have both theoretical and practical implications. From a theoretical point of view, we learned that integrating a computerized 3D IVR environment as part of a mediated learning and DA procedures creates an “intellectual partnership” between the computer, the subject, and the examiner-mediator. This partnership, it seems, creates a unique perceptual experience that broadens the subject's world of mental images, it strengthens the internalization of the mediated cognitive principles and contributes to her/his achievements. Therefore, one can also say that 3D IVR technology is an important and appropriate environment for assessment. It seems, as well, that the evaluation of a child's ability to express cognitive modifiability is also influenced by the mode of representation in which the assessment is carried out, by the degree of immersion and partnership of the child with the computer and by the examiner. We believe that these two points are an important contribution to the Dynamic Assessment approach.

Our findings show that this study has brought to light a wide range of clinical and educational applications of DA and 3D IVR technology. It seems that it can be used to predict, the subject's degree of cognitive modifiability outside the school or classroom settings. We believe that by that a new additional set of diagnostic instruments has been made available to educational diagnosticians, who will now be able to administer DA procedures that might better reflect the child's learning potential. In the assessment procedures, it will be possible to alter the traditional assessment tools in exchange for rich and versatile 3D virtual worlds that will open up new possibilities for a wide range of cognitive diagnostic procedures and for a wide range of populations. Those tools will open a wide world of opportunities for the examiner that cannot exist in DA procedures without an appropriate technology.

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David Passig
Bar Ilan University, Israel
david@passig.com

The logo for the International Association for Frontiers in Education (iafor) is centered on the page. It features the word "iafor" in a light blue, lowercase, sans-serif font. The text is enclosed within a circular graphic composed of two overlapping, semi-transparent arcs: a light blue one in the foreground and a light red one behind it, creating a sense of depth and movement.

An Immersive, Interactive and Augmented Classroom: A Proof-of-Concept

Daniel Echeverri ^a Zayed University, UAE

The Asian Conference on Technology in the Classroom 2015
Official Conference Proceedings

Abstract

The use of mobile technology has individualized education in certain ways and even when there is a sense of a connected learning community, the classroom itself remains a passive space whose only function is to contain users, faculty and furnishing. This research introduces a prototype that combines movement, projections and an interface that surrounds the user.

It presents a study of the interface design and considers different ways to generate interactions by using 3 types of body gestures: made with the fingers, the hand and the arms. It will also explore the hand as an element that defines the proportion of the interface instead of the fingertips like currently happens in touch-enabled devices. Interactions can range from acquiring information from diverse web sources, to sharing a document or an image, to combining classroom supplies like post-its and markers in a common environment. This environment allows the student to integrate their mobile device as a key that will give them access the projected interface, their files and materials on the cloud while interacting with their peers.

Users will be able to manipulate virtual objects with gestures as if they were physical ones; objects can be rotated, resized, shared, mixed and even modified by several participants at the same time. No longer a will student have to print or pin a mockup of a piece. Instead, they can upload it from their device into the projected Workspace and share the work with their peers. Physical objects like paper sketches or physical models and prototypes can be integrated by capturing their images and inserting them into the environment. This method of mobile technology will change the parading of a device as an isolated personal object and will transform the classroom into an active space.

Keywords: Interaction, Design, Natural User Interface, Augmented Reality, Mobile Learning

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Introduction

A lot has been speculated about the future of user interfaces and its evolution. In the 2010 TED Talk series, John Underkoffler from Oblong Industries and UI consultant for several movie studios in California presented a several gesture enabled interfaces designed as interactive systems (**Fig. 1**). He proposed leaving behind the idea of the mouse, as a medium of interacting and replacing it instead with the hand as a more accurate way to do it. During his presentation, he presented the iconic scene in *Minority Report* in which the main character of the movie uses natural gestures without keyboard, mouse or command line to interact with a computer. [1]

Figure 1: John Underkoffler explains the human-computer interface he first designed for the film *Minority Report*. Photo by Steve

Lab discussed the use of peripheral projected
ing the 2013 edition of SIGCHI Conference [2]
oy them for this system, proposed extending the
from experience of playing these games beyond the TV screen into furniture and
other furnishing in a common room.

Figure 2: IllumiRoom concept. Room setting and physical environment reaction of particles.

Image courtesy of Microsoft Research: <http://research.microsoft.com/en-us/projects/illumiroom/>

By leveraging physical environments to create combined virtual-physical experiences using projections this project enhances and augments objects and spaces in the real world over visible surfaces. For example, if in the video game it is snowing, then the projection outside the TV screen would show snow particles falling and bouncing over the real furniture that exists in that space. In the paper "*IllumiRoom: Peripheral Projected Illusions for Interactive Experiences*" the team discussed the potential of

this technology not only in the entertainment industry, but in a professional setting like an office or even a classroom.

Similarly Paul Marshal from the Open University defined a framework that focuses on tangible interfaces aimed for learning. [3] This framework included considering the possible benefits to the users as well as the exploratory and expressive activity carried over by the interacting subjects. The integration of representations in this type of interactions allowed the learner to assimilate new information to improve learning transfer, planning and reflection.

Figure 3: "The Office of the Future"

Sketch by Andrei State and Henry Fuchs. Use of the image with permission from the authors.

Henry Fuchs and his team from the University of North Carolina presented something similar to Underkoffler and Jones in Siggraph'98 with the paper "The Office of The Future". [4] (**Fig. 3**) They proposed using projections over different surfaces and furniture in an office setting. The paper discussed the challenges of projecting over un-even and irregular objects to transform them into immersive displays. This paper also outlines the possible optimization of light schemes that can capture depth and reflectance of the surface at different levels during any given interaction. Finally, Chris Dede from Harvard University discussed other benefits of immersive interfaces. [5] In his paper, he mentioned that enabling digital simulations leverage interaction between learners with different skill levels. Projected interfaces activate existing spaces and transform them without making significant changes to a structure. This activation facilitates new experiences and augments existing physical spaces while complementing the learning context. In some way, this acts as a bridge between the real and the virtual world.

Context

Components

There are three main components that define this project:

Immersion is defined in this context as a way to generate an image whose main objective is to surround the interacting subject or subjects. Currently, immersion can be achieved by using virtual reality head-mounted displays like the Oculus Rift or through big scale projections that involve several projectors at the same time.

Interaction is the two-way flow of information between a computer and a user while responding to a particular input. For example going to an ATM machine to make a cash withdrawal or simply talking to another person. In the paper "*How Bodies Matter: Five Themes for Interaction Design*" by Klemmer, Hartmann, Takayama, they discuss the way physical bodies are important when interacting with

the world shape and how those interactions the way people think, learn and solve problems [6].

The last component would be **augmentation**; making something greater by adding a layer information to it. For example, the Google Glasses are a recent case of augmented technology; by using a wearable device (the glasses) with an optical head-mounted display; it adds an extra layer of information to what is visible in the real world. This works by beaming a projected image directly onto the retina at the back of the users' eye. For example someone can walk to buy groceries and be able to see step-by-step other example of augmentation is 3D Projection augmented Reality. Used mostly in digital art and turns surfaces, often irregularly shaped, into a display surface for video projection (Fig. 4).

Figure 4: Projection Mapping to Tokyo Station -Tokyo Michi Terrace 2012.
Photo: t-mizo Creative Commons

Interaction and Augmented Reality: The Challenges

Technology itself is a huge challenge for education through interaction, and sometimes plays the opposite role and ends up being a distracting element in the educational process. Social Media, chatting, downloading other content takes all the attention during class, to the point that some Universities are banning the use of Smartphones and Social Media in the classroom. [7] Mobile Learning, when used correctly is a great interactive tool, but there is no real collaboration as most of the work is done through each students' individual smartphone or tablet. The sense of learning community is present, but it is, in certain situation isolating and individualistic.

The cost itself of some technology also represents a big challenge; currently the average cost of a brand new Smart board is around \$5,000 US dollars. A prohibitive expense to most institutions. Even investing in less expensive and most common technology. A 30 million dollar initiative by the Los Angeles Unified School District in 2013 pretended provided 640.000 iPad tablets to the students, but after the first year the program was cancelled due to students hacking the devices, using them with other ends besides education, as well as issues with the distribution model. [8] Technological over-saturation can also be a challenge. Institutions are investing heavily in implementing big screen TVs, high definition projectors and surround sound speakers in most classrooms, changing its real nature of a learning environment and making them media centers instead [9].

Zayed University: A Case Study

Zayed University (ZU) is one the three government-sponsored higher education institutions in the United Arab Emirates offering undergraduate and graduate programs. Among the six Colleges that are part of Zayed University, the College of Arts and Creative Enterprises offers the programs of Visual Arts, Graphic Design,

Interior Design Multimedia and Animation. Design classes tend to differ from lecture classes in the way the material is presented and manipulated by the students; it follows a learn-by-doing approach that allows the student to experiment, interact, build, critique and discuss their project in an open context. The classes at ZU are thought in specially designed studio classrooms with state of the art equipment and furnishing. The layout of the classrooms follows the same structure as other studios in other design institutions around the world. Classrooms include a common space where the students meet and critique their projects, as well as computing equipment to develop prototypes and mockups. **(Fig. 5)** The classrooms are also equipped with high-speed Internet, HD projectors and in some cases TVs or Smart boards.



Figure 5: Three of the studio classrooms available to Zayed University design students.

After analyzing the spaces available for Design Students in Zayed University, three common elements that could be considered as a challenge for an Immersive, Augmented and Interactive classroom were found: existing furniture, recent investment in technology and empty surfaces (walls, desks and pin boards). These challenges were also identified at other institutions consulted by the author including the School of Visual Communication Design at Kent State (USA), and the Graphic Design program at Colegiatura Colombiana (Colombia).

Learning Platforms

Current interaction design paradigms are shifting from interfaces suited for small keyboards and mouse pointers that use small buttons, windows, menus and icons to

finger-friendly interfaces that make use of big icons, gestures, contextual menus and clear visual hierarchy. However, the current software used in the classrooms is designed for desktop computers aimed for office use and not class use. This is translated into PowerPoint presentations projected into big screens or PDF documents enlarged in a TV screen, making real interaction almost impossible. Additionally, learning platforms such as Blackboard and Moodle used by institutions does not account for an optimum user experience. These platforms are not responsive to the wide array of mobile devices the students have access to, and end up being overlooked by faculty and students. Recent studies have showed high levels of dissatisfaction and low usage of these learning platforms especially when posting content, assigning individual tasks, and doing peer reviews on student work. [10]

Proof of Concept

Taking into consideration the challenges discussed in the previous section and the current state of computing technology, this concept will make use of a projected interface combined with a motion-tracking sensor that will replace the need of mouse pointers and limited screens. At the same time, this will allow to use different surfaces to project on, and adapt them to the needs of the class; a lecture, a studio or a working group session. By following the concepts presented by Underkoffler and others [1-6], this interface will make use of gestures and physical interaction to leverage the learning process of the students and improve the way they think, learn and solve problems.

This Proof of Concept will explore new practices for User Experience, Human Computing Interaction and Interface Design. By using a hand-centered design approach, hand proportions will be the main level of interaction instead of the fingertip or a mouse pointer. The hand-centered design is an adaptable platform that can work with the needs and dynamics of a class while engaging the students, and integrating virtual objects with physical manipulable objects. It will leverage the use of smartphones and other mobile devices as the entry key to a shared space. This leverage expands the interaction in a co-creative environment where real collaboration can happen.

Technology

In order to develop this concept and later a working prototype, this project will make use of the latest version of Microsoft Kinect V2. Microsoft presented this motion-sensing device in 2009 as Project Natal during the E3 video game conference in Los Angeles. The first version was launched publicly in 2010 bundled with the Xbox 360 console. The V2 version of the Kinect sensor includes an infrared sensor, a 512x424 pixel time-of-flight camera that can measure distance based on the measurement of the speed of light, a wide field of view and a 1080p video camera. It allows tracking of to 6 participants at the same time doing multiple gestures and has a four-microphone array that allows voice control. At the time of writing, the cost of this device is \$200 US dollars including an USB adaptor.

Along with the Kinect Sensor, the project will take advantage of currently installed Video Projectors with HDMI allowing the projection High Definition images and video in the classroom. Both devices will be connected to a laptop computer with

USB 3.0 ports for high-speed data transfer and the latest version of Microsoft Windows. The combination of these three elements (Kinect, Projector and Computer) will grant a low budget solution that does not require additional investment other than the motion sensor. This will reduce possible costs of reforming a classroom, as well as full flexibility on where and how the students interact.

Design

This project explores using the hand as the replacement to the mouse pointer as the main way to navigate an interface. This requires exploring new proportions that go beyond the 30 pixels a pointer has or the 48-pixel size suggested for touch devices. [11]

Figure 6: The “Active Grid”, the base of the Design behind the interface and the navigation

Characteristics of the human hand that condition the way it interacts with touch points as the fingertips (orange), the finger’s reach (light blue), the maximum horizontal reach for the fingers (light blue), and maximum vertical reach (red). By overlapping all the physical characteristics of the hand, an “active area” is found in the center of the hand. This active area allows interaction without the need of pointers or digital pens since it is at the reach of fingers and the palm. At the same time, it adjusts to the proportions of mobile phones and other mobile devices like tablets making the inclusion of this easier. An evolution of this grid takes into consideration left and right hand; by overlapping both of them an “Ambidexter Grid” was created to define the final proportion of every visual element including icons, typography and the layout of the elements in the projected interface (**Fig. 7**).

Figure 7: *Left:* Active Grid Overlapping. *Right:* Ambidexter Grid, the proportion of the hand and the average size of a 6” smartphone. Ovals represent the radial placement of the icons.

Figure 8: The interface lay out. In the middle a smartphone with the embedded QR that activates the access to the Workspace

The use of the grid extends into the entire visual communication of the interface. Icons share the same proportions as the grid and are laid out in a radial way around the smartphone, which becomes the center of the interaction. From that point, buttons and options will be expanded to the reach of the user and other participating users. This way, all the individual options are tied to the mobile while the shared Workspace outside their smartphone extends as much as the projected surface allows.

Use in the Classroom

The first step for a participant would be placing his or her smartphone over the table where the interface is going to be projected. This can be a table or a small desk where students can be surrounding it. On the screen of the smartphone a QR code will be displayed. The code would have encoded the student name, the student ID and an email address. The camera of the Kinect will identify the code and validate the identity using the institution student database. Once validated, a set of buttons will surround the phone and identify the student with a unique color (**Fig. 8**).

Since the Kinect can track up to six participants, six color schemes will be available in the interface; these way participants will identify themselves in the Workspace, making a color the user's avatar. If the student wants to interact the only thing that he or she will need to do is place the hand over the button to activate a function or drag an object into the Workspace. Buttons could also be dragged and changed position as if they were also objects. Objects in the Workspace are manipulated as if they were physical objects; for example to resize an image the gesture would be dragging two opposite corners with the hands, or in order to rotate it one hand would act as axis while the other rotates around that axis.

Files and objects could be shared between users by dragging the objects thumbnail into the other persons' active area, eliminating the need to physically share a USB drive or emailing a file. For this to happen, a cloud storage service will be available to

the interface and each student will have access to their own cloud folder; documents, images, video, bookmarks and sound clips can be shared into the Workspace. Any user could upload to their own cloud folder from their smartphone or personal computer and create a “queue” which resembles a playlist in terms of the order certain files would be used. This can be relevant to present a project or during a lecture about a specific topic where the faculty would prepare the queue and then send it to the Workspace from their folders. The Kinect sensor will be tracking each one of the users smartphones and in case there is a need to reposition the device, the entire user environment will move along with the device.

Using the sensors’ ability to measure depth, the Workspace will adapt to the geometry of the surface that is projected on. This is useful in cases where the space is limited or the furnishing available is irregular. Thanks to the high resolution camera embedded in the sensor, the interface could also adapt itself based on the surface color or the reflection level optimizing the contrast and colors of the interface and reduce the impact a surface could have in the projection. For example if this interface is projected over a dark wood table, then the interface will intensify the projection output by using bright intense colors and high contrast level. The opposite would happen if its projected over a light wood or white surface. Considering that a projection over a low flat surface such as a table is not always optimum or comfortable during long periods of time, the interface can adapt itself into a vertical mode more suited for a lecture class or to a presentation. **(Fig. 9)**

Figure 9: *Left:* Horizontal Mode. Projection over a low surface like a table.

Right: Vertical Mode. Projection over a white board or a wall.

In the vertical model, key actions represented in buttons like drawing, deleting or adding an object a “Chasing Toolbox” will follow the user the same way as when tracking the smartphone in the horizontal mode. This facilitates reaching the tools and reducing the time to switch between them. **(Fig. 10)**

To avoid cluttering in the Workspace, the interface uses a depth-of-field function that will blur out inactive objects emulating the human eye and reducing the attention to distracting elements. Objects will activate themselves when a hand is close to them or in case of the vertical mode, when someone is close. Most objects can use the “pin” feature to avoid getting blur out; for example that is useful if someone is presenting a project and several participants want to draw over or add extra information to the object. Once the smartphone is removed from the Workspace the user would be logged out from the interface and a new user can enter in case the maximum participant number is reached.

Virtualization of physical objects is possible by combining the HD camera and the Time-of-Light camera in the sensor. By combining both image streams, the interface would be able to differentiate from flat and a volume. A capture button will show next to the object and an image capture of it will be inserted as a new object. Once the object is virtualized, it can be manipulated like any other object in the Workspace and the physical object removed.

Conclusions

This paper is the beginning of an idea that can have a significant impact on the way a student learns and engages with information. Marshal mentioned in his paper that “Physical interaction with interfaces are suitable for collaborative learning; it allows the learner to explore existing representations while improving concreteness and sensory directness of the participant”. [4] On the other hand, Dede [5] argues in favor of projected interfaces as a way to activate existing spaces and icant changes to a structure and as a way to nt existing physical spaces. At the end, the between the real and the virtual world innate to

Figure 10: Vertical Mode. “Chasing Toolbox” over the left shoulder. Other students participating in class are displayed in green on the right side of the Workspace

young learners and important initiatives to use technology as a real learning tool. One of the most interesting challenges is breaking common conceptions on how we interact with machines; we are used to clicking on buttons, closing windows, and using metaphors to represent actions, all inside the limits of a screen. Interaction should be limitless as ubiquitous computing becomes common and accepted in the day-to-day life. Having a hand-centric approach to interactions allows users to have a natural flow of information with the machine, and requires less use of fine motor skills and integrates better in diverse learning environments. Mobile learning is a relevant tool, but should not be seen as only using a phone to take pictures or solve a

quiz using a learning platform. Mobile learning needs to extend beyond the smartphone and integrate as a seamless tool inside any curriculum.

This interface can be applied to fields other than learning design or classroom use. Its simple language, high contrast color scheme and large scale interface could suit people with limited mobility, limited vision and other learning disabilities such as problem solving or spatial reasoning. It could be used in the corporate world in presentations and brainstorming sessions. Inside the operation room, where there is a limited space, projections could aid doctors and nurses without the need to depend on a screen next to the patient.

As any other concept, this project is still a work in progress that will present interesting challenges from a design and a computing perspective. Currently this research is focused on completing the interface design and doing basic paper testing with a small sample of students. Funding is being sought through the Office of Research and via the Research Incentive Grants from Zayed University. Funding will be used to develop a working prototype and will move into identifying what the impact Augmented Reality could have in a shared environment. It will explore not only the way students respond to an interface like this, but how it affects their design work, their engagement from other students, the ways it can enhance discussions and influence the student's strategy within their projects.

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Contact email: Daniel.Echeverri@zu.ac.ae

Fostering Independent Learning through the Use of Edmodo and a Self-Access Learning Center

Roxana Sandu, Hirosaki University, Japan

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Abstract

Web 2.0 technologies have become a ubiquitous component of our daily lives (McBride, 2009), and their immediate exploitation in the field of second/ foreign language education came as no surprise. The present study aims at examining students' comprehension of independent learning and their views on whether using online tools combined with the use of a self-access learning center (SALC) helps in some way with their learning process. The participants are all freshman students at Hirosaki University, Japan, enrolled in compulsory or elective English courses ranging from elementary to advanced levels. Over a period of one year, Edmodo, a free online learning platform, is used in EFL classes in order to enhance students' learning. In addition, in order to foster independent learning, students are also encouraged to use a semi-guided SALC at Hirosaki University, Japan. In order to gather as much insight as possible on students' perceptions about using a SALC in addition to online tools, data is collected through informal group interviews and questionnaires. The results show that (1) some students are not comfortable using a SALC or Edmodo for various reasons, and (2) are not used to take responsibility for their own learning. The presenter will argue the relevancy and need of independent learning and learner autonomy in the Japanese context.

Keywords: SALC, Edmodo, independent learning, Japan, technology-enhanced learning

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Introduction

In a world where globalization and internationalization are omnipresent at many levels in the society, foreign language education is constantly redefining itself, searching for new ways to respond to the new generations of students' needs. The language educator is faced with the great challenge to build on the great body of existing literature while carefully assessing his or her own students' needs and goals. Therefore, although neither the use of technology nor the use of self-access learning centers are new when it comes to independent learning, my belief is that learners could benefit greatly from being directed towards such an approach.

The well-renowned definition of autonomy as a capacity of the learner to take charge of his or her own learning (Holec, 1981:3) offers a glimpse into what this type of learning is all about. I would further argue that the skills learners acquire by becoming autonomous learners benefit them later in life when they must function as individuals capable of working by themselves even in societies where collectivism is highly regarded. Much has been debated on the issue of learner autonomy being ethnocentric (Riley, 1988; Jones, 1995; Littlewood, 1999). Riley's (1988) question "Are the principles and practice on which 'autonomous' and 'self-directed' learning schemes are based *ethnocentric*?" is what started the concerns about cultural appropriateness in relation to autonomy in language education. However, there has been a visible shift of focus in the recent years on the Japanese scene. As cited in Nakata (2011) "now in Japan the importance of autonomy is valued more than ever (The Ministry of Education, Culture, Sports, Science and Technology (MEXT hereafter), MEXT, 2003, 2008, 2009)." Nakata (2011:908) concludes in his study that "many Japanese EFL high school teachers, while understanding the importance of autonomy, are not as yet fully ready for promoting it in their learners". These results make us assume the fact that university students are not much acquainted to other styles of learning than the traditional one where the student is passive and the teacher holds the authority.

Hence, under this context, the present study emerged in the attempt to shed some light on how Japanese students react when introduced to different teaching and learning styles than they are used to. It aimed at examining (1) students' views on whether using online tools combined with the use of a SALC helps with their learning process, as well as (2) students' comprehension of independent learning.

Independent and autonomous learning

Benson (2001:7) reports the concept of autonomy in language education has originated in Europe in the late 1960s. However, he further points out that the concepts of independent and autonomous learning have their roots deep in the Western ideologies, beyond the field of language education. Among others, he uses Galileo Galilei's view on teaching and learning as a direct exemplification: "You cannot teach a man anything; you can only help him find it within himself (Benson, 2001:23)." The following sections briefly address the relationship of independent learning with technology and self-access centers, as well as the role the learner should hold in the development of his or her own life-long autonomy.

Independent learning, technology, and self-access

Gardner and Miller (1999) state, "Self-access is probably the most widely used and recognised term for an approach to encouraging autonomy". Moreover, whenever in question, the interdependence of independent learning, technology-enhanced learning, and self-access is undeniable, being widely assumed and somewhat acknowledged. Lazaro and Reinders (2006) even refer to SALCs as being "‘technology-rich’ environments". Benson (2001:10) writes, "Because self-access centres have been enthusiastic consumers of educational technologies, self-access learning has also tended to become synonymous with technology-based learning." Exploring the relationship between self-access and independent learning, Sheerin (1997:55) gives two main reasons for setting up self-access centers. One reason is individualization and the other one the promotion of independent learning. Though much can be said about this interdependence, what past literature emphasized is "that there is no necessary relationship between self-instruction and the development of autonomy" (Benson, 2001:9) and "self-access does not necessarily ensure learner independence" (Sheerin, 1997).

Self-access centers (SACs) have been around for more than three decades now and enjoyed a high popularity around the world, especially in Europe. Fouser (2003:62) explains that "the development of SACs in Japanese universities has lagged behind other advanced countries", the reason being that "foreign languages are integrated deeply into the general education curriculum that has its origins in the pre-war upper high school." He further clarifies "the curriculum of the pre-war upper high school viewed foreign languages as part of a well-rounded "cultural" education, or *kyōyō* in Japanese, that marked membership in the ruling elite, rather than a practical skill (Takeuchi, 2001). "However, under the pressure to shift the focus of English language education toward a communicative approach, Japanese universities also started to build self-access centers or make use of old language laboratory transforming them into foreign language centers. The range of what a SALC contains is rather wide and highly dependent on the size and budget of the university in question. Some of these centers are state-of-art buildings with the latest technology available, whilst others are one big room that crams together everything that a SALC entails. Benson (2001:114) defines it as "any purpose-designed facility in which learning resources are made directly available to learners. These resources include audio, video and computer workstations, audiotapes, videotapes and computer software, and a variety of printed materials."

On the other hand, when it comes to the use of technology in the field of general education, a great deal of research has been conducted. As the focus of this paper is not the use of technology in a SALC but in an EFL class, the emphasis of the brief literature review will be on the educational use of virtual learning environments (VLEs) to complement the traditional classroom setting. Much has been written about the use of social-networking sites (SNSs) for educational purposes. McBride (2009:35) defines SNSs as "websites built to allow people to express themselves and to interact socially with others." She further argues "self-expression and social interaction are some of the most important contexts for language use that we try to create, or at least imitate, in our foreign language (FL) classrooms to encourage language acquisition." The literature provides a myriad of examples in which SNSs, such as Facebook, Ning, Mixi, and others, can be used to benefit the students whether

it is throughout an entire course or for one task at a time (Pinkman, 2005; Fellner and Apple, 2006; McBride, 2009; McCarty, 2009; Kabilan et al, 2010; Hitosugi, 2011; Prichard, 2013 among others).

Although the previous literature reported on the positive effects the use of a SNS has on students in a foreign language class, the Japanese context remains somewhat unaccounted for. Investigating student willingness to use SNSs in EFL classes, Hooper's (2014) study results show us that a high number of 44 students are unwilling to do so in comparison to 51 students who are willing to use them. Some of the reasons provided by the 44 students unwilling to use them were "that SNS use would make the course difficult. Another concern was that they wished to use SNSs for social purposes only. Also, some believed that using SNSs in an English course would lead to distractions or to a reduction in the quality of the course" (Hooper, 2014:244).

Autonomy and the learner

Nunan (1997:194) maintains that "most learners, at the beginning of the learning process, do *not* know what is best." Based on Nunan's model, Benson (2001) concludes "autonomy develops alongside proficiency". On the other hand, Littlewood (1997:82) argues that autonomy is possible only when "students possess both the *willingness* and the *ability* to act independently". He further explains that willingness depends on students' levels of motivation and confidence, whilst ability depends on their levels of knowledge and skills.

As Nunan (1997:195) sees autonomy not as something students possess but as a process that needs to be developed, he proposes five levels of implementation for increasing the degree of learners' autonomy. These levels are: (1) awareness, (2) involvement, (3) intervention, (4) creation, and (5) transcendence. Later on, in Nunan (2003) he introduces nine steps to learner autonomy: (1) Make instruction goals clear to learners, (2) Allow learners to create their own goals, (3) Encourage learners to use their second language outside the classroom, (4) Raise awareness of learning processes, (5) Help learners identify their own preferred styles and strategies, (6) Encourage learner choice, (7) Allow learners to generate their own tasks, (8) Encourage learners to become teachers, and (9) Encourage learners to become researchers.

Although in this study the steps abovementioned were not followed as such, they were implemented to some extent but with no direct explanations of strategies for independent learning. The study was based on the prediction that students will start develop themselves as autonomous learners only through the types of tasks specifically designed with this goal in mind, as well as the requirement of visiting the SALC. Thus, learners were encouraged to develop autonomy indirectly, only through various tasks the teacher designed, assuming they will find the motivation within to "take charge of their own learning".

Methodology

This section briefly addresses the methods used in this study. First section introduces the participants who took part in the study and the course settings. The second section discusses the procedure, offering a brief description of Edmodo and the SALC at

Hirosaki University. Finally, the rationale behind administering the students' feedback questionnaire is considered.

Participants and course settings

A group of 76 undergraduate students from Hirosaki University, a national university in northern Japan, took part in this study. The majority of these participants are first year students who were enrolled in a required or elective English course in year 2014. 39 of the students were enrolled in compulsory Basic English courses during the first term, though the remaining 37 were enrolled in a compulsory and an elective Advanced English course during the second term.

Procedure

As part of the course requirements students had to use Edmodo and visit the English Lounge (EL), a semi-guided Self-Access Learning Center (SALC) easily accessible and free of charge for Hirosaki University students. In order to assess students' perceptions of using a VLE in combination with a SALC to encourage independent learning, at the end of each term, a questionnaire was administered to the participants. In the following sections each step of the procedure will be described in detail to offer a clear explanation of the rationale behind the procedure.

Edmodo

The selected SNS for this study is Edmodo, a free online learning platform, very similar to Facebook in its interface and regarded as user-friendly. The platform is secure in the sense that students require a certain code to sign up and only the teacher can determine who can join the group. It was introduced to complement the traditional classroom, by encouraging more communication and collaborative work among students, but it was mainly used for creating assignments and quizzes, sharing various types of files (documents, audio, and video), giving feedback, and keeping track of students' progress. During the second term, collaborative work and communication among students was encouraged through the 'Small groups' function on Edmodo.

Both the students enrolled in the Basic English and Advanced English courses had to review the class material by themselves and take a quiz created on Edmodo, which provided a score immediately allowing them to view the correct answers. The quizzes were meant to develop the habit of reviewing the material, as well as confirming their understanding of the material. The other task was writing the original text of their assignment and then rewriting it after they had it checked by a teacher at the EL. The rationale behind this task was that learners would benefit from rewriting the task, by reflecting on their own mistakes and avoid making them again.

For the students enrolled in the Advanced English course, more freedom of choice was allowed in terms of topic selection for final projects. In addition, students were asked to write what their goals at the beginning of the course as expectations they have from the course. They were not asked though to track their progress and the efforts they have made towards achieving those goals.

The English Lounge

Each center is unique not only in what it has to offer but also in its managerial approach, and the SALC available at Hirosaki University, the English Lounge (EL), is a rather small one in comparison to others, such as the SACs at Kanda Institute of Foreign Languages or Hiroshima Bunkyo Women's University. It includes various types of resources, a conversation area, and a multi-purpose room where 60 minutes classes are regularly offered, and occasionally events, seminars, and workshops are held. It has five faculty members who work on a shift basis, giving classes and offering advice for the interested students, as well as participating and facilitating the conversations held in the conversation area. In order to provide a more relaxing atmosphere at the conversation area, a number of international students from various countries, native and non-native speakers, are hired every term to assist the teachers and to encourage intercultural exchange. It also provides counseling for students who are interested in exchange or volunteer programs abroad.

As abovementioned, students had to go to the EL for checking their writings or presentations, in order to acquire a more natural like English. They were encouraged to interact to any of the other teachers available. This type of activity was assumed it would raise their interest about the EL and its activities, and encourage them to use the EL on a regular basis.

Students' feedback questionnaires

The questionnaires administered were typical student feedback questionnaires asking general questions about the course, classroom activities, the teacher's performance, and more specifically, questions about the use of Edmodo and the SALC at Hirosaki University. The following are the main parts of the questionnaire used at the end of the first term: (1) questions associated with a 5-point Likert scale ranging from 'strongly disagree' to 'strongly agree' regarding classroom activities, Edmodo virtual classroom activities, the teacher's and the student's performance, The English Lounge, and (2) open-ended questions regarding things they most liked and disliked in this course, Edmodo's most convenient aspects, and ways of improvement for the course itself and for the teacher's teaching methods.

Since it was rather difficult to interpret the results of the questions associated with the 5-point Likert scale due to neutral answers, the questionnaire used during the second term was slightly modified. By doing so, the researcher expected to obtain more reliable results in terms of objectivity. Hence, similarly to the abovementioned one, this questionnaire was also comprised of two parts, the only difference being that the questions in the first part of the questionnaire were associated with a 4-point Likert scale ranging from 'strongly disagree' to 'strongly agree' instead of a 5-point Likert scale. In addition, one more question was added to the 'Edmodo virtual classroom activities' sub-section of the questionnaire.

Therefore, the data was divided into two: (1) First term data and (2) Second term data to avoid any alteration of the results. In accordance with the purpose of this paper, the following questions were selected for analysis:

Table 1: Student Feedback Questionnaire Items

First term data set (5-point Likert scale)	Second term data set (4-point Likert scale)
<i>Edmodo virtual classroom activities</i>	<i>Edmodo virtual classroom activities</i>
Edmodo is difficult to use and troublesome.	Edmodo is difficult to use and troublesome.
Submitting my assignments/ quizzes via Edmodo is meaningless.	Submitting my assignments/ quizzes via Edmodo is meaningless.
The use of Edmodo is effective and useful in my learning.	The use of Edmodo is effective and useful in my learning.
	*It was convenient to send files and video files via Edmodo.
<i>The English Lounge</i>	<i>The English Lounge</i>
I hate going to the English Lounge.	I hate going to the English Lounge.
I love the opportunity to interact with other English teachers.	I love the opportunity to interact with other English teachers.
It was troublesome and meaningless.	It was troublesome and meaningless.

Additionally, the open-ended questions selected to facilitate the analysis are:

- (1) What did you like least about this course? Why?
- (2) What was the most convenient aspect of Edmodo?
- (3) What do you feel I need to work on to become a better teacher?

The open-ended questions were used only when needed to provide further explanation as some of the students' answers also provide valuable insights of their perceptions and attitudes towards the use of Edmodo and the SALC. Moreover, short informal classroom interviews were conducted to gain more insight in what students regarded as difficult or troublesome in using Edmodo and the SALC. Students' answers were recorded by the teacher and the meaningful information used for complementing the analysis where needed.

Results and discussion

Each of the following sections discusses the results of the data analysis, first considering students' attitudes toward using the online learning platform, and second, considering students' attitudes toward using the self-access learning center.

Students' reactions to using Edmodo

First term data set

Students' answers to Statement 1 (henceforth S1): "Edmodo is difficult to use and troublesome." were interpreted in terms of difficulty towards the use of Edmodo. As it can be seen from Fig. 1, the fact that the majority (53.8%) of the students disagreed and strongly disagreed to S1, and the rather high percentage of students who either remained neutral (23.07%) or agreed and strongly agreed (23.07%) to S1, could lead us to believe that the use of Edmodo did pose some challenges.

In order to gain more insight about what sort of difficulties students encountered while using Edmodo, the open-ended questions were analyzed. Some of the

challenges students reported on the use of Edmodo were (1) it takes a long time to get used to its interface, (2) technical problems, such as Internet connection or web site access problems, and (3) no computer at home so difficult to submit weekly assignments (See Sandu (2015) for more details). Although the teacher offered a thorough explanation and even explained step-by-step to small groups how to sign up for Edmodo, special time for a walkthrough session should have probably be considered to guide low-tech students. Regarding technical problems and similar issues, the teacher encouraged students to submit their assignments in a timely manner to avoid this happening, and to give them enough time to try again.

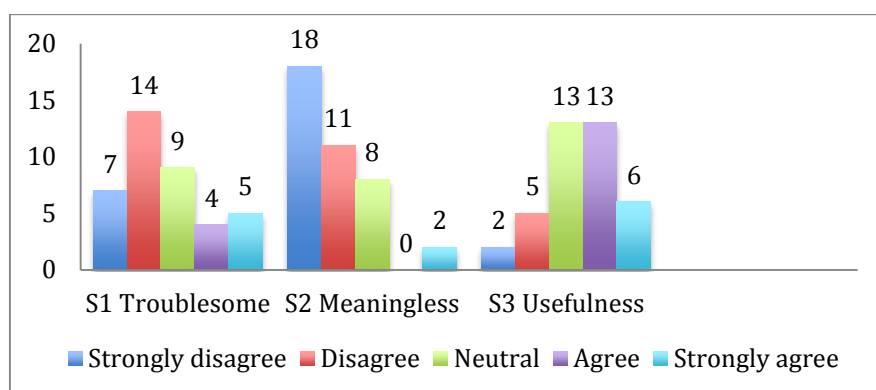


Figure 1: Students' answers regarding Edmodo

Students' answers to Statement 2 (henceforth S2): "Submitting my assignments/quizzes via Edmodo is meaningless." were interpreted in terms of its significance. The high percentage of students who agreed and strongly agreed to S2 (74.3%) show us students regarded the use of Edmodo as a platform for submitting regular assignments and taking occasional quizzes highly beneficial. In addition, students' answers to the open-ended questions stressed the fact that they enjoyed taking the quizzes and submitting assignments via Edmodo. "Most students wrote they liked the fact they could submit their homework from their own home at any time. This allowed them to work at their own pace, without being constrained to go and hand it in directly to the teacher." (Sandu, 2015).

Students' answers to Statement 3 (henceforth S3): "The use of Edmodo is effective and useful in my learning." were interpreted in terms of its effectiveness. This statement aimed especially at the use of Edmodo as a platform for receiving direct feedback from the teacher. The teacher occasionally commented on students' assignments by pointing out reoccurring grammar mistakes and misuse of words or idioms. Since only 48.7% of the students agreed or strongly agreed to S3, it could be inferred that the remaining 33.3% (accounts for neutral answers) and 17.9% (accounts for the percentage of students who disagreed and strongly disagreed to S3) were not sure of or did not believe that the use of Edmodo helped with their learning process.

As Sandu (2015:0223) mentioned, the fact that a high number of students reported on Edmodo's ineffectiveness could be attributed to two things:

(1) Students were unsure of the (dis)advantages of using online tools in language learning and they could not understand how Edmodo supplements the physical classroom in this respect.

(2) Teacher's explanations of the rationale behind using Edmodo in her class were not explicit enough to justify its use.

Second term data set

Students' answers to S1, S2, and S3 were interpreted in terms of difficulty, significance, and effectiveness of Edmodo's use similarly to the first term data set in the previous section. In addition, students' answers to Statement 4 (henceforth S4): "It was convenient to send files and video files via Edmodo." were interpreted in terms of convenience. As shown in Fig. 2, in comparison to 32.4% of the students agreeing and strongly agreeing to S1, more students (67.5%) disagreed and strongly disagreed with S1, allowing us to assume that for the majority the use of Edmodo did not pose much challenge. The impressive percentage (91.8%) of students who disagreed and strongly disagreed to S2 reinforces the idea that Edmodo is a valuable tool when it comes to submitting assignments and taking quizzes. Similarly, the rather high percentage (72.9%) of students who agreed and strongly agreed to S3 could be interpreted as a sign of Edmodo having a positive effect on their learning. In terms of its convenience regarding the function that allows the upload of various types of files, 67.5% found it helpful.

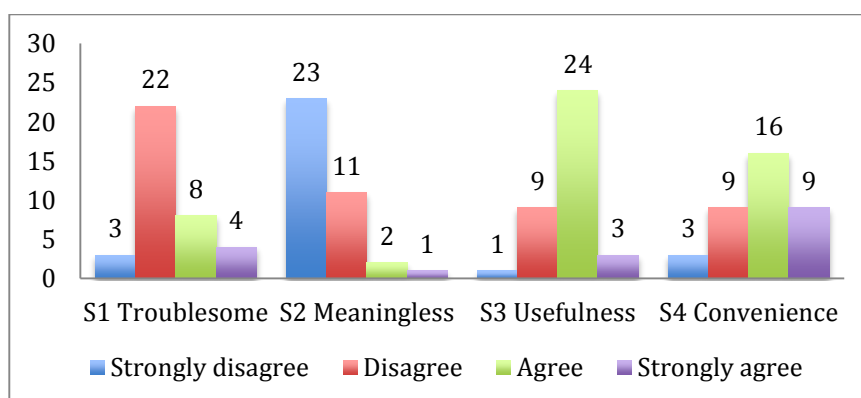


Figure 2: Students' answers regarding Edmodo

Similarly to the first term data set, students' answers to the open-ended questions reinforce the same points:

- (1) Some students would have preferred a walkthrough class especially designed to get them accustomed to Edmodo's interface and its functions.
- (2) Submitting assignments via Edmodo, sending files, and communicating with group members, were some of the functions students found useful.
- (3) Few students would have preferred an alternative option to submitting assignments, as they either did not have a computer at home, or occasionally encountered technical problems when using Edmodo mobile application.

Students' reactions to using a SALC

First term data set

Students' answers to Statement 1 (S1): "I hate going to the English Lounge." were interpreted in terms of their level of comfort and dislike regarding using the EL. In addition to 33.3% who remained neutral to S1, the high percentage (46.1%) of students who agreed and strongly agreed to S1, lead us to an undeniable conclusion: students did not enjoy using the EL. Interestingly, despite the fact that they did not like going to the EL, 56.4% agreed and strongly agreed to Statement 2 (S2): "I love the opportunity to interact with other English teachers.", allowing us to assume they valued the experience itself although they felt uncomfortable going there.

Moreover, as shown in Fig. 3 below, students' answers to Statement 3 (S3): "It was troublesome and meaningless." were interpreted in terms of significance regarding their learning. With a percentage of 56.4% disagreeing and strongly disagreeing to S3 we could assume the majority of the students found the use of the EL meaningful. However, the 25.6% who remained neutral to S3 show us that a rather large number of students were not convinced the use of the EL was meaningful enough for their learning.

Considering the high percentage of students showing reservations or even discomfort regarding visiting the EL, the teacher engaged them in an informal discussion about the reasons why they dislike visiting the EL. Some of the main reasons they mentioned are: (1) lack of confidence in their English skills, (2) lack of time due to their busy course schedules, and (3) related to (1), anxiety of entering a space where only English is spoken. Other reasons mentioned were the difficulty to interrupt a teacher if he or she is already engaged in a conversation with other students, being at the conversation area with students who have a good command of English. Therefore, although few of the students who participated in this study continued coming to the EL occasionally none continued coming on a regular basis. Most of those who did visit the EL after the course ended, sought for a teacher's advise on their writing assignments or grammar use.

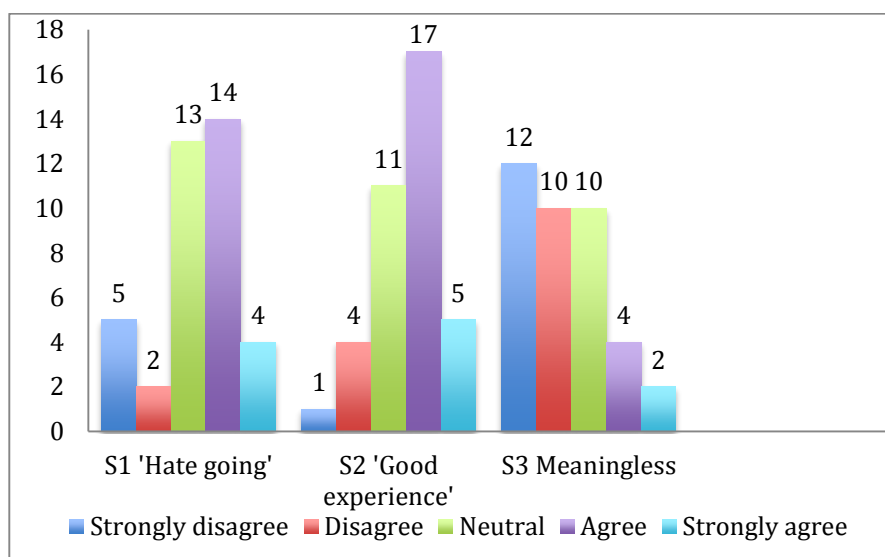


Figure 3: Students' answers regarding the EL

Second term data set

Students' answers to S1, S2, and S3, were interpreted similarly to the first term data set in the section 4.2.3. As shown in Fig. 3 below, the fact that 59.4% agreed and strongly agreed to S1, while 40.5% disagreed and strongly disagreed, could lead us to the same conclusion that students did not enjoy using the EL. In spite of them not feeling comfortable using the EL, the vast majority of 81.08% considered it a good experience as it offered them the opportunity to interact with other English teachers. Moreover, 83.7% disagreed and strongly disagreed to S3, which stresses the fact that students found the use of the EL meaningful.

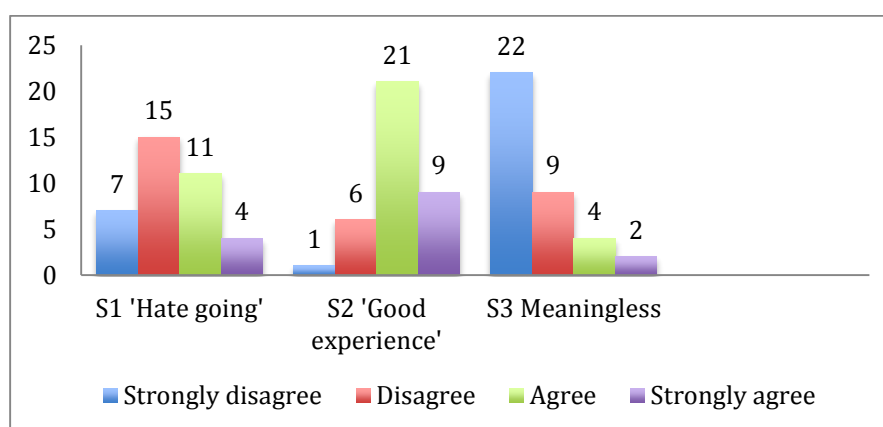


Figure 4: Students' answers regarding the EL

In addition, the analysis of the open-ended questions revealed that the students enrolled in the second term had slightly different reasons for not liking going to the EL. Whilst this is understandable since they were enrolled in an Advanced English course, none of them mentioned the lack of confidence in their own English skills. What most of them answered was that they did not have the spare time to go to the EL due to very busy course schedules.

Conclusions

This study aimed at examining (1) students' views on whether using Edmodo and a SALC would help with their learning process, and also (2) students' comprehension of independent learning. In terms of using Edmodo in an EFL class, some of the functions students found useful were submitting assignments, sending files, and communicating with group members. Some students would have preferred a walkthrough class especially designed to get them accustomed to Edmodo's interface and its functions. And few other students would have preferred an alternative option to submitting assignments, as they either did not have a computer at home, or occasionally encountered technical problems when using the mobile application.

On the other hand, in terms of using a SALC, the results clearly show that students did not feel comfortable visiting it. Although few of the students who participated in this study continued coming to the EL occasionally none continued coming on a regular basis. Most of those who did visit the EL after the course ended, sought for a teacher's advice on their writing assignments or English grammar use. The study also shows students were not familiar with independent learning or what it entails,

therefore it can be easily assumed that in order to guide them towards autonomy a more direct, structured, and explicit approach is needed.

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Digital Tablets: A Trojan Virus for ICT in Education?

Jean Simon, ESPE Université de La Réunion, France

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Abstract

IT, still now, has not really entered classrooms because its use constitutes a work overload for teachers. It requires several breaks that teachers must manage: breaks in time, in space and in pedagogy. Digital tablets avoid all those breaks; this is why they should be soon omnipresent in classrooms. Therefore, we have to try, right now, to see how this will change the educational landscape and how the roles of students and teachers should evolve.

Keywords: digital tablets

A large, faint watermark of the iafor logo is centered on the page. It consists of the lowercase letters 'iafor' in a light blue font, surrounded by two concentric, semi-transparent circular arcs in light blue and light red.

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Introduction

There is no translation in English for the French word “informatique”. “Informatique” is the automatic processing of digital information. So, for the following, we will use “Information technology” (IT) as translation of “informatique”. For M. Serres (2013), information technology revolution is equal to the one of writing. Writing has allowed storing information on a medium other than brain and, thus, the outsourcing of memory. Computers allow to process information by a medium other than brain and, thus, the outsourcing of many other cognitive processes. This outsourcing is already showing its effects. For example, calculator has made that fewer and fewer people are able to do mental arithmetic. This outsourcing of cognitive processes has led some researchers to consider otherwise their research objects. One of the main ideas is that we should not consider the “person-solo” but the “person-plus” (Perkins, 1993): the person “plus” his environment (books, computers, other people ...).

This paper is a prospective paper which relies on the existing literature on IT for education. It shows that digital tablets should not follow the cycle of a new technology described by Cuban (2001) which ends with the underutilization of this new technology. On the contrary, digital tablets should be widespread and really used in most of the classrooms. This will enable information technology to enter those classrooms and to modify them with the emergence of what we could call students “plus” and teachers “plus”. First we explain why digital tablets should be widespread. Second, we present what changes should appear in classroom due to that. Finally we discuss some possible points of failure.

Tablets are the Trojan that will allow information technology to finally get into the classrooms

Failure of IT represented by the traditional PC

1. Failure

In all countries, findings are the same. We observe many local successes of introducing IT in education. However, large scale, there are everywhere an integration slowness and much greater difficulties than expected (Fourgous, 2012; Cuban, 2001). One of the reasons often invoked to explain this is that the use of IT in classroom implies to change pedagogy (Fourgous, 2012). However, Cuban (2001) doesn't go in this direction: having observed the diffusion of IT, he finds that it is not because the students studied with computers that pedagogy is necessarily modified. He said the majority of teachers use technology for reproducing or for supplementing traditional activities rather than to innovate. This finding was echoed several times (Blin & Munro, 2008; Eynon, 2008).

So we can wonder if the necessity of a change in the way of teaching could be the major reason for the underutilization of IT. Maybe it should be better to tackle the problem in terms of cost-benefit. This is what do Abboud-Blanchard & Robert (2013): If the benefit that teacher gets by a change exceeds the cost, it is likely that he will opt for change. The problem is that this benefit is not proven. Thus Cuban (2001) has demonstrated that studies showing that use of IT should facilitate learning are often counterbalanced by studies showing that its use has no impact.

Nevertheless, if we cannot be sure of the benefit, we can be sure of the cost: most studies show that the use of IT represents a heavy workload, particularly for the preparation of the class. Fourgous (2012) noted "Achieving all or part of a course with IT requires time that everyone is not willing to invest." For Gentil (2000), and Cleary et al (2008) the reasons given by teachers to explain their non-use of IT are the overwork in the course preparation and in the rooms and material management.

2. Reasons for the work overload

Going in the same direction, Karsenti and Gauthier (2006) indicate that, if IT is underutilized, this is because it doesn't correspond to the class organization. One of the predominant aspects is that machines, most of the time, are not in the classroom but in a computers room. That involves several breaks:

- break in time: time required or expected to access the computer room, (Cleary & al, 2008)
- break in space: to leave the classroom and go to the computers room, (Cleary & al, 2008) (Gentil, 2000)
- break in equipment : material failure, often due to its use by different users, (Gentil, 2000)
- and possibly break in pedagogy: a minimum, frontal instruction disappears. Students will focus on the machine and this will give "over the shoulder" pedagogy and not face to face.

A classroom lives, and often the constraints due to PCs are in contradiction with this life (Bétrancourt, 2007). In the computers room, student activities are often disconnected from the life of the class.

Tablet avoids all these breaks

Thus, we believe that, if, till now, computers have not entered classrooms, one of the main reasons is that there was not enough space (in the strict sense) into classrooms for them. It's not possible to put one PC per student in classical classrooms. With notebooks there is always the power supply problem. Digital tablets eliminate those two problems. They can be assimilated to books, classical schoolbooks.

Boujol (2014) has enumerated the properties that make digital tablet similar to a book:

- Like a book, tablet can be easily integrated in classroom:
 - o it can fit in the locker, or in the student briefcase
 - o its screen is not interposed between student and teacher,
 - o the absence of mouse, replaced by touch screen, and the lack of power cable, due to autonomy, enable a small footprint. Thus, space on table is sufficient.
- Like a book, tablet provides immediate access, you can leave tablet on standby all day without problem.
- Like a book, tablet is mobile.
- Like a book, tablet allows easy classroom management, in "one to one" or workshop.

Finally, tablet seems easier to use than a computer for non-technophiles. Kinship with smartphones is probably the reason.

This similarity to the book should make that tablets will be easily integrated in class. The investigation of Karsenti and Fievez (2014) shows it. Their study examined 6057

students and 302 teachers who were equipped with tablets. 88.5% of students reported using them an average of 30 minutes or more for a 60 minute class period.

Tablet is going to be a Trojan horse for IT in education

Thus, tablets should not follow the Cuban's cycle (Cuban, 2001) because they do not require extra work, they do not require a change in pedagogy. Moreover their cost can be very low (Melhuish & Falloon, 2010). Those are the reasons why they should be widespread.

The question which arises is what types of uses will occur. This is here that we have to consider that a digital tablet is a computer able to process information. This will make tablet a Trojan which will introduce information technology in classrooms.

The results should be:

- Tablet will start to take over the education of students,
- Roles of teachers and students will change,
- A lot of information on what happens in the classroom will be digitized.

What will be the impact of this Trojan?

So, with the tablets, the automatic processing of digital information will get into classrooms. This will necessarily have an impact on all information generated there, but also on people who emit and receive this information. This will profoundly change the various roles of those people but also the reasons why they are together in classroom.

Student-plus

Nowadays, we have no more to educate a student, we have to educate a student "plus", "plus" digital tablets, "plus" Internet. A child, who has grown accustomed from an early age to seek answers to his questions on Internet, doesn't think in the same way than his elders. Similarly, a child, who knows that he will find again his answers on the Internet, will not memorize them in the same way. So we can consider that the skills he will have to acquire will not be the same than those of his parents.

1. The example of the calculator

To explore those possible changes, we can consider the example of the calculator. A calculator is also a computer that can process information. Since its first appearance, its ability to process information has led to changes in the teaching of mathematics.

For some researchers, calculator hinders the development of mental calculation and memorization of the tables (Schaub, 2009; Bourdenet, 2007). Bourdenet (2007) found that, nowadays, college students are less familiar with mental arithmetic than 10 years ago. The reason is that calculators are everywhere outside of the school and basic mental calculation is no longer maintained in everyday life. The problem is that good mental arithmetic skills are needed to control higher-level process: to be able to provide an order of magnitude, to be critical towards a result...

The example of the calculator leads us to split skills that students must acquire, or not, in three categories:

- Skills not to be acquired anymore (for example, to be able to extract a square root);
- New skills to be acquired due to the use of this computer tool (e.g. to be able to program his calculator);
- Skills to be strengthened in school because their practice outside of school will tend to weaken (e.g. to be able to do mental arithmetic).

In addition to these skills, we could propose a metacognitive skill: enabling students to know when they have to use or not their calculator.

These proposals can be generalized to any computer and more particularly to digital tablets. In what follows we give some examples.

2. Skills that we accept to abandon

Skills, whose learning is no longer needed, can be twofold: On the one hand, skills that we accept to outsource on the machines, on the other hand, skills that have become obsolete.

If there is some agreement on the fact that the algorithm of the square root extraction should no longer be taught, because it can be outsourcing on the calculator, it is not the same for the abandonment of the learning of the division algorithm (Charnay, 2002).

Similarly, the abandonment of the learning of cursive writing is debatable. This abandonment is a good example of abandonment for obsolescence. Proponents of abandonment argue that in our digital society this skill is no longer necessary. Opponents argue that this skill is the basis of other higher-level skills such as learning to read, communication or fine motor skills (Blazer, 2010).

3. Skills to be strengthened

Skills to be strengthened are the counterpart of skills which can be abandoned. It is difficult to identify them a priori because: First, we must anticipate those that a continued use of machines will make the individual to lose and, second, we must assess how this loss will be detrimental to him. The loss of mental calculation mentioned above is a good example of this kind of skill.

For example, with the advent of the Internet, Graham and Metaxas (2003) have demonstrated the need to strengthen critical thinking about the information found on the Web. Liu (2005) for his part shows that reading on the Internet is characterized by more time spent browsing, non-linear reading, selective reading so he proposes to strengthen the linear reading of long books.

To our knowledge, there is no research on the impact of the use of the GPS to move around. We can wonder to what extent it will affect the sense of direction or the ability to read a map. If, indeed, the GPS has an impact on those skills, do we have to strengthen their learning in school or do we accept their outsourcing on machines?

4. New skills to be acquired

The new skills needed in the digital era, are probably those that are currently the most studied (Eshet, 2004) (Bawden, 2008). They constitute the digital literacy (Eshet 2004). According to Eshet (2004), they can be spread in different categories: cognitive, motor, sociological or emotional. They can consist in skills such as to be

able to build new information from existing information on the web, or build collaboratively information and share it.

Among these new learnings, programming a computer is under debate (Temperman & al, 2014). Thus, the Royal Society in Britain or the Academy of Sciences in France call for the development of this learning in elementary school. The major reason is that a future citizen should be able to dominate the IT main concepts in order to fulfill his role in a society where computers are omnipresent. The detractors consider this learning is not a fundamental learning and also it will confuse other basic skills because of the time it will require (Temperman & al, 2014).

5. A metacognitive skill

Maybe the more important skill that students should acquire is a metacognitive skill: to be able to know when they have to use IT and when it's better not to use it.

Teacher « plus »

We saw above that teachers are not all prepared to change their way of doing class and that one possible reason is the cost of this change. Digital tablets do not require changing pedagogy, there is a possible use of them for each teacher profile. That's why we believe they will become widespread.

1. Different types of possible uses of the tablet by the teacher

There are different pedagogical approaches for IT in education (Benoit & Sagot, 2008):

- The “tutorial” approach where computers can be considered as “a kind of coach.” It is based on systematic exercises, assessment and remediation programs, etc.
- The “prosthetic” approach where computers and specialized input / output devices become tools that can directly or indirectly compensate a loss function in disabled child.
- The “augmentative” approach where computers and writing tools (or calculation, or consultation) allow increasing the student's skills.
- The “re-education” approach, where computers are intended to address some difficulties that a student could meet.
- The “procedural” approach, where computers become powerful inducers of reasoning and creativity (see LOGO and especially the micro-world of the turtle)
- The “communicational” approach, where networks and Internet allow establishing distance exchanges.

Villemonteix and Khaneboubi (2013) find that teachers who are project promoters have more complex use of tablets based on an important educational thought and on an asserted technicality that allow them to combine those different approaches. For (Melhuish & Falloon, 2010) most innovative uses are based on connectivity and convergence, (approach “communicational”). For Bétrancourt (2007), these more innovative uses, which involve building knowledge by students, collaboration and exchange of ideas, are seen as inaccessible by many teachers. Thus, the other teachers, depending on the discipline, use the tablet for either training or assessment

activities (tutorial or rehabilitative approach) or for consultation online resources, etc. (manual and augmentative approach). Anyway, if, according to their profile, teachers use tablet differently, the survey of Karsenty and Fievez (2014) shows that all of them use it. They show also that, when tablets are used heavily, it is essentially as digital schoolbook.

2. Digital schoolbook

Digital schoolbook should generate a kind of paradox. It should be widespread because teachers can use it without breaking with their usual practices and, at the end, it should lead teachers to change their practices.

a) From paper schoolbook to interactive digital schoolbook.

The digital schoolbook can range from simple digital PDF version of the paper textbook, to interactive textbook through enriched textbook. When textbook becomes digital, it is possible to enrich it with video, animations, augmented reality, etc. (Park & al, 2012). Just adding these media already allows a first adaptation to different profiles of students: more visual or more auditory etc. (Bedi, 2014). Moreover, these enriched textbooks can become interactive (Tuesdays & Everhart, 2013) with the addition of a whole set of features: moving the pages, zoom on images, text highlighting, annotations, synonyms, cross references. Some of those features are more focused on learning: file transmissions, assessments, creation of learning content (Park & al, 2012). Gradually, these digital schoolbooks reinvent the schoolbook itself and become learning methods or training resources management systems. This makes that student is gradually taken over by the machine. This provides more easily differentiated instruction in classroom where individualized and tailored applications are adapted to each student (Melhuish & Falloon, 2010). The choice of applications can be done by the teacher given the needs of his students but, more and more, can be operated by the machine given the assessments it has automatically done. Therefore these digital schoolbooks become, gradually, intelligent tutoring systems where domain knowledge and student are modeled (Huang & al, 2012). These systems take into account the errors of the student and offer him situations that allow him to correct them (Li and Akahori, 2013) (Bang & al, 2013).

b) Modifications in role of the teachers

This type of schoolbook will necessarily change the role of the teacher in the classroom. A part of his work will be shifting on the machine. Take the example of the learning of handwriting in kindergarten (Jolly and Gentaz, 2013): When children learn to write, teacher can show a limited number of times how to draw letters. Moreover, he cannot be behind each of them to verify that the pupil follows approximately the right track. Both aspects, to show and to verify, are supported now by tablet and can be repeated endlessly by the pupil. Thus, progressively, teacher should be relieved of a whole set of tasks: correction of exercises, proposal of remedial exercises, etc. This will change what he was doing before. He should become a facilitator who guides the student (Noor-UI-Amin, 2013 ; Park & al, 2012). However, it is important to note that this transformation will not appear abruptly: it will be progressive.

Digitizing information produced in classrooms

In today's society, most of information is digitized on machines (photos, music, telephone conversations, medical files, bank files, etc). These data are thus easily accessible and studied. So far, in education, those studies concern rather distance learning. In online education, the use of groupware, learning management system or distance education grows increasingly. On these systems, students deposit documents, participate in forums, share with their teachers and with their colleagues. Most of these systems record the traces of these activities. These traces constitute huge masses of data that researchers are studying. Their approach includes use of algorithms: decision trees, rules induction, artificial neural networks, Bayesian learning,... (Romero & Ventura, 2007) that reveal rules, behaviors which can be classified or clustered. In the context of education we speak of Education Data Mining (EDM). The goal of EDM is to improve the teaching process by providing feedbacks at all levels both at the institution level that defines the teaching programs, or the teacher's level following a set of students remotely.

Until now, this type of research could not enter classrooms because it was very rarely that information, appearing there, was digitized. The arrival of digital tablets will change this in depth because they will lead to digitize a larger share of information generated in a classroom. This information can be studied to improve learning (Huang & al, 2012). Suppose, an interactive schoolbook used by several thousand students. Its editor will be able to observe the exercises where students are successful, those on which they fail. Better yet, if there is failure, he can check the type of errors that appear most of the time and try to remedy them by offering other types of exercise, other approaches. The schoolbook is, thus, increasingly customized to the student profile (Huang & al, 2012).

We see how the arrival of these tablets could advance educational research. We also see that this would lead to a virtuous circle: data study -> improved schoolbook -> improved learning-> data study ->...

Discussion

The above does not address the problems that are emerging in the use of digital tablets. A partial list of these problems could be:

- Bandwidth problems,
- Maintenance problems and software management problems,
- Non-school use problems,
- Problems because tablets would be only consultation tools,
- Teachers training problems.

These problems should not be ignored because they can generate work overload for teacher and block the widespread use of tablets.

The bandwidth problem often appears in the articles (Karsenti & Fievez, 2014 ; Boujol, 2014). We have seen that tablets allow communicating between peers or with teacher. There can be also exchanges with servers, for example, when digital schoolbooks are online. So there could be an accessibility problem. In school, the network may not function properly especially for overload reasons when all students

are connected at the same time. Outside the school, student might not have access to a network (Karsenti & Fievez, 2014). Indeed, if the bandwidth is reduced, or there is no, this limits the uses but this does not prohibit them totally: Digital schoolbooks can be on tablets and there can be local communication solutions between machines.

The problem of tablets management is a recurring problem in papers (Villemontaix, Hamon) (Boujol, 2014). This management consists in the recharge of tablets and the loading of applications. These two problems are not identical while loading of applications is done only from time to time, recharge of tablets shall be done several times per week. This problem raises the underlying question of who owns the tablet and therefore who manages it. If it belongs to the student, it is to him that it will be asked to put in charge every night and to install the applications. If the tablet belongs to the institution it will be necessary to have good mobile device management system to not generating any work overload for teachers.

Another problem cited (Karsenti and Fievez, 2014) is the use of tablets for non-school purposes (social networks, games). This one is pretty easy to get around by setting up internet filtering. Also it seems to disappear with education, students disciplining themselves progressively. Another problem reported is that tablets can be used only for consultation and not for production. Karsenti & Fievez (2014) and Villemonteix & al (2014) wonder if, in fact, the deficit for a production use is not related to a misunderstanding of the tool. According to many researchers (Boujol,2014; Karsenti & Fievez,2014) if tablets are spreading, it seems that the only self-study of the teachers will not be sufficient and it will be necessary to train them. We wonder if it will be still true in a few years when everybody will use them permanently.

There is a last point which is important to discuss but which will not impede the widespread of the digital tablets. We can wonder if each data which is digitized is not a loss of freedom. If this question is important for the society, it is necessarily important for schools at the time we begin to digitize information in the classrooms.

Conclusion

We proposed that information technology is not entered so far in classrooms because there was physically not enough space for it in classrooms. Therefore, to use IT, teachers have to go out of their classrooms; this generates a whole series of work overloads. By its functional proximity with the book, tablets remove all these obstacles. That's why they should be widespread in all classrooms.

However, in contrast to the book which only store information, tablet is able to process information. This will change considerably all relations in the classroom, between student and teacher, between student and other students and between student and knowledge. This, thus, leads to look at skills that a student, who constantly has access to this tool, must acquire: those that can be abandoned, those that must be strengthened and finally the new ones that must be acquired. This also leads to reflect on the triangle "student-teacher-knowledge" and the new position of the teacher in this triangle.

In the discussion, we mention the possible obstacles to this dissemination of the tablets.

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The logo for 'iafor' is centered on the page. It consists of the lowercase letters 'iafor' in a light blue, sans-serif font. The text is enclosed within a circular graphic composed of several overlapping, semi-transparent arcs in shades of blue and red, creating a sense of motion or a stylized globe.

Three Approaches to Cultivating Academic Honesty and Fighting Plagiarism

Alexander Nanni, Mahidol University International College, Thailand
Rahul Sangar, Mahidol University International College, Thailand

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Abstract

Academic honesty is a critical concept for students who are enrolled in university studies; however, many university students have at best a loose understanding of what academic honesty entails. Plagiarism comes in many forms, including verbatim plagiarism, patchworking, and self-plagiarism. Even those students who have some awareness of plagiarism may only recognize and avoid certain types. For this reason, many students unintentionally engage in plagiarism, jeopardizing their success at university. This paper will explain three approaches to developing students' knowledge and practice of academic honesty: specific uses of Turnitin.com, a test that discretely assesses students' ability to paraphrase and cite sources correctly, and a media-based term project. These approaches help develop students' understanding of the meaning of educational integrity, so they will be able to take their place in the wider academic conversation. The approaches range from the more traditional to projects involving new media and technology, providing varied exposure to key concepts. The content of this paper will be of interest to educators in diverse institutions, who will be able to adapt these approaches to meet their students' needs.

Keywords: Plagiarism; Academic Honesty; Media-Based Projects; Turnitin.com

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Introduction

University education provides many opportunities for students, not least of which is the opportunity to learn effective written communication. This opportunity, an “opportunity for students to hone both their capacity for original, critical insights and their ability to express these insights in the written word” (Dee & Jacob, 2012, p. 398), can be undermined by plagiarism, which is a relatively common practice in many student populations. For example, McCabe (2010) found that 58 percent of the 24,000 American high school students that he surveyed admitted to plagiarism; however, this behavior is certainly not limited to high school students, nor is it limited to the United States. Plagiarism is “a major educational problem and major social concern” in Thailand (Songsriwittaya et al., 2009, p. 9), as it is in many other countries. The prevalence of plagiarism and its potentially serious consequences create a need to address this issue.

This paper describes three ways in which students learn about plagiarism and academic honesty at the Preparation Center for Languages and Mathematics at Mahidol University International College in Salaya, Thailand. The Preparation Center offers courses in intensive English for academic purposes to students who wish to enter English-medium programs at the international college. The stated goal of the college is to provide its students with “quality liberal arts education” (“A liberal arts education in an Asian setting,” 2012). Meaningful interaction between students and professors (as well as among students) is essential to a liberal arts education (Blaich, Bost, Chan, & Lynch, 2004), and such interaction is facilitated by clear communication. Students who do not learn to express themselves clearly will not be able to make the most of their liberal arts education. For this reason, academic honesty is emphasized in the Preparation Center’s curriculum.

Merely punishing students who plagiarize is not a sufficient solution to the problem. Students plagiarize for many reasons, including ignorance of the meaning of plagiarism and the belief that plagiarism constitutes ethical behavior (Ashworth, Bannister, & Thorne, 1997). In addition to having a clear academic honesty code, teachers and institutions “should engage students in a complex understanding of what plagiarism is and why it’s penalized in our institutions” (DeVoss & Rosati, 2002, p. 201). Cultivating such an understanding is the goal of the approaches to teaching about plagiarism that is presented in this paper. The paper begins by exploring various taxonomies of plagiarism. It then describes the approaches that an intensive English for academic purposes program at a Thai university has taken to addressing plagiarism and discusses these approaches through the lens of pertinent literature. Finally, it offers possibilities for further development.

Taxonomies of Plagiarism

Researchers have offered various taxonomies of plagiarism. A common taxonomy proposes four ways in which students plagiarize (for example Brandt, 2002; Howard, 2002; Park, 2003; Wilhoit, 1994). The first way involves stealing an entire essay from another source and asserting one’s own authorship. Sources could include essay mills, essay-writing services, online content, or other students. The second way involves asserting authorship over work that was written for a specific assignment by another person, such as a student’s relative — a practice that is sometimes called

ghostwriting. The third way involves copying sections verbatim from several source texts. In this case, students may provide correct citations and references but fail to paraphrase or quote the sources adequately. This practice is often called patchworking. The fourth way involves paraphrasing from source texts but neglecting to provide citations and references to acknowledge the authors whose ideas are being restated.

A second taxonomy of plagiarism has been developed by computer scientists aiming to create plagiarism-detection software (Alzahrani, Salim, & Abraham, 2012). While this taxonomy does not address certain aspects of plagiarism that are included in the taxonomy described above (e.g., it contains no mention of ghostwriting), its strength lies in its systematic approach to cataloguing the various ways in which individuals can copy or manipulate source text in an effort to illegitimately claim it as their own. This recent taxonomy “highlights differences between literal plagiarism and intelligent plagiarism, from the plagiarist’s behavioral point of view” (Alzahrani et al., 2012, p. 133). Literal plagiarism, which is much easier to detect than intelligent plagiarism, involves submitting an exact copy of a text, a near copy of a text, or a restructured copy of a text. In a near copy, words would be either substituted, inserted, or deleted. Sentences could also be joined or split in an effort to avoid detection. Intelligent plagiarism, which is more sophisticated and thus more difficult to detect, can take three forms: text manipulation, translation, or idea adoption. Text manipulation involves the use of paraphrasing or summarizing. The plagiarist significantly changes the language of a text, but not the ideas. Even if the language of the text has been changed significantly, citations are still necessary in order to give the original author credit for his or her ideas and to avoid plagiarism. Translation is the second type of intelligent plagiarism. It includes both manual and automatic (e.g., Google Translate) methods. The plagiarist could either make use of translation, in which a text in another language is translated into English, or of back translation, in which a text in English is translated into a second language and back into English, greatly altering the language of the text. The final type of intelligent plagiarism is idea adoption, which could be considered the “most serious form of plagiarism” (Alzahrani et al., 2012, p. 135) as it involves the wholesale theft of ideas. Overall, this taxonomy is a useful overview of the behaviors, if not the motivations, that comprise plagiarism.

Turnitin, a company that provides an online plagiarism-detection service, has published a recent taxonomy of plagiarism. This taxonomy is based on a survey of 879 educators from various countries and on the analysis of thousands of papers submitted to their website (Turnitin, 2012, p. 3). The relatively informal names given to the various types of plagiarism were meant to make them more relevant and understandable to “the generation of students who are ‘digital natives’” (Turnitin, 2012, p. 3). In order of perceived severity as measured by the survey, the ten types of plagiarism are as follows: Clone, CTRL-C, Mashup, Aggregator, Recycle, 404 Error, Find-Replace, Hybrid, Remix, and Re-Tweet. The three most common errors, which are also perceived as the most severe, are Clone, Mashup, and CTRL-C. Clone involves submitting someone else’s work without making any changes. CTRL-C involves copying large portions of a single text. Mashup involves copying material verbatim from multiple sources without citing the sources. Four of the seven remaining types — Find-Replace, Hybrid, Remix, and Re-Tweet — describe variations on the same theme, i.e, verbatim plagiarism and use of text or ideas without attribution. The last three types of plagiarism differ substantially from the others.

Students engage in 404 Error when they cite nonexistent sources or cite existing sources inaccurately; in Recycle, or self-plagiarism, when they resubmit work that had already been submitted in a different class; and in Aggregator when they cite properly but do not include any original ideas. The Turnitin taxonomy is similar to the others in several regards, but it also introduces additional academic honesty issues specific to secondary and higher education. Each of the three taxonomies described has advantages, and each contains elements absent from the others. The first has the virtue of being relatively simple, the second comprehensively describes specific means of plagiarizing, and the third is designed to be understood by students. Only the first taxonomy mentions ghostwriting, only the second mentions translation, and only the third mentions self-plagiarism. These taxonomies complement each other in providing a more complete view of this complex issue.

Three Approaches to Reducing Plagiarism

Recognizing that plagiarism encompasses a wide range of behaviors and that many students enter the program with little understanding of what it means to plagiarize, the Preparation Center for Languages and Mathematics uses multiple approaches to raising students' awareness of this issue. These approaches attempt to respond to the many reasons that students engage in plagiarism, which include a misunderstanding of the goals of academic writing (Whitaker, 1985), lack of skill (Briggs, 2009), ease of finding texts to plagiarize on the Internet (DeVoss & Rosati, 2002), and ignorance (Ashworth et al., 1997; Dee & Jacob, 2012). The three approaches described below, along with a clear academic honesty policy, attempt to address these underlying reasons.

Turnitin.com

Turnitin.com is a web-based service that evaluates the originality of texts. When a text is submitted to Turnitin, the text is automatically checked against online resources and against all papers that have previously been submitted to Turnitin. Sections of the student text that match online texts or other student papers are highlighted. If the student text matches an online source, the teacher can view the online source text. If the student text matches a previously submitted paper, the instructor may request a copy of that paper. This request must be approved by the instructor to whom the paper was originally submitted. Turnitin can be used across the curriculum; however, it is particularly well-suited to language classes, as the site provides peer-editing and commenting functions. One disadvantage of Turnitin is that it requires an institutional subscription, meaning it will not be available to all educators.

At the Preparation Center for Languages and Mathematics, Turnitin is used for all major writing assessments, which include the term papers written by the intermediate and upper-intermediate students. These papers are completed over the course of nine weeks, and students submit an outline and drafts before submitting the final paper. Turnitin is used to check the outlines and drafts as well as the final product. This gives teachers a chance to provide formative feedback and discuss academic honesty with the students by reviewing their originality scores. These scores show the percentage of the students' submission that matches other texts. Students frequently misinterpret the originality scores in that they often assume that an acceptable term

paper would be almost completely original, but this is not necessarily the case. Citations, references, and properly-cited quotes can all legitimately match other texts. Discussing this idea using their papers as concrete examples can help students differentiate between legitimate borrowing and plagiarism.

Turnitin is effective in addressing several of the reasons why students plagiarize. Once students have seen the originality reports of their drafts and discussed them with their teacher, they cannot claim ignorance. Turnitin explicitly indicates which sections of the text are not original, and the teacher can explain academic honesty using the students' own papers as examples. He or she can also explain to students the goals of academic writing. These goals include the expression of original ideas supported by the use of source texts, as opposed to the accumulation of information. Additionally, Turnitin reduces the perceived ease of cheating. While it may be easy to copy texts from the Internet and submit them in lieu of original work, it is equally easy for teachers to detect such behavior using Turnitin. This will deter students from engaging in CTRL-C (Turnitin, 2012, p. 4) plagiarism, patchworking, and related practices.

Academic Honesty Test

While Turnitin is a useful tool in teaching students about academic honesty, it does not fully address all reasons why students plagiarize. Even with the best intentions, students may plagiarize because they do not have the necessary skills in paraphrasing or citing, especially in a second language. Also, they may not be able to distinguish common knowledge from proprietary ideas that must be cited. The Preparation Center for Languages and Mathematics has developed a test to help students improve these skills. The test is given in the intermediate class approximately one month after the start of the term. It is relatively minor part of the students' overall assessment, but its inclusion in the curriculum motivates students to engage with this material.

The academic honesty test has two sections. In each, the students are given a text of approximately 400 words. In the first section, students are asked to determine whether each of a series of 10 sentences based on the given text are academically honest and correctly formatted. Common errors include omission of a citation for statements that are not common knowledge, incorrect formatting of the citation, inaccurate paraphrasing, and verbatim copying of the source text without quoting. In the second part of the test, students answer a further five questions about the second text. Each of the five consists of a sentence that contains an error related to academic honesty. Students are given a bank of choices from which they must identify the type of error. The choices include complete omission of a citation, a problem with the reporting phrase, incorrect transcription from the source text, an in-text citation error, and copying from the text (missing quotation marks). Once the students identify the error, they must rewrite the sentence to correct it. This test develops students' ability to identify and correct problems that relate to academic honesty.

Media-Based Assignments

Even students who understand academic honesty and plagiarism may cheat. They simply may not feel that plagiarism is wrong (Ashworth et al., 1997), perhaps because of their cultural understanding of ownership or individualism (DeVoss & Rosati, 2002). Another cause of cheating is that they find their assignments unfulfilling, that “the work does not invite or deserve creative energy” (Zwagerman, 2008, p. 696). In these cases, developing their knowledge and skills may not be effective in reducing plagiarism. This creates a need for a further approach to addressing plagiarism, a need which has been filled at the Preparation Center for Languages and Mathematics through the creation of media-based assignments that discourage plagiarism by their very structure.

An example of a media-based assignment is the term project that is the focus of the lower-intermediate class. This assignment is completed over the course of nine weeks. Each student is assigned a faculty advisor and a country in the Association of Southeast Asian Nations (ASEAN). The students read news stories about that country and select a current event that they feel is interesting and worth sharing with their peers. They then write a 550-word text about their chosen event that synthesizes information from various news sources and relates that event to the Thai context. Once their texts have been approved by the faculty advisor, the students plan and record a 6-minute video about the event. The first three minutes present the findings of the students’ research. After the overview, the students include two short interviews, neither of which can exceed 1.5 minutes. The faculty advisor watches the videos with the students and gives feedback. At the end of the term, the videos are shown to the class. The teachers select one video from each class to show to all of the lower-intermediate students, who vote to select the best video. The best video and runner-up receive awards, and the best video is shown at the student orientation the following term. This project discourages plagiarism in two primary ways. The students must appear in the video and conduct the interviews, activities that require direct personal involvement. Furthermore, the students choose the focus of their project and present it to an authentic audience, making the work more meaningful. The resulting motivation leads to an increase in engagement and a decrease in plagiarism.

Discussion

These three complementary approaches to cultivating students’ academic honesty and discouraging plagiarism have been successful at the Preparation Center for Languages and Mathematics. Turnitin creates opportunities for formative feedback about academic honesty and deters many types of plagiarism. The academic honesty test serves to strengthen students’ paraphrasing and citing skills as well as their understanding of when information is common knowledge. The media-based projects have been designed to require active participation, reward creativity, and stimulate motivation. Together, these approaches have significantly reduced the instances of most types of plagiarism in the program.

Despite the initial success of these approaches, there is still a need for further development. Turnitin cannot detect all types of plagiarism, most significantly the theft of ideas. Also, not all assignments that the students complete will be intrinsically

motivating. High school and university students sometimes need to write papers about topics that they find tedious. In addition, while preparing for the academic honesty test gives the students an introduction to the skills that they need to paraphrase and cite effectively, these skills need to be practiced. For this reason, the process of developing students' academic honesty should continue throughout their education.

Conclusion

This paper has introduced three approaches to cultivating students' knowledge of academic honesty and to discouraging plagiarism: the use of Turnitin, an academic honesty test, and a media-based project. Each of these three approaches teaches students about different types of plagiarism, and together they address many of the reasons why students plagiarize, including a lack of understanding of what plagiarism entails and a lack of the skills necessary to avoid it. By developing this knowledge and these skills, these approaches prepare students to take full advantage of their educational opportunities.

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*Learning by Digital Games Design in Children's Teaching and Learning
Process: Issues and Challenges*

Md Nasir Masran, Universiti Pendidikan Sultan Idris, Malaysia
Laili Farhana Md Ibharim, Universiti Pendidikan Sultan Idris, Malaysia

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Abstract

The development and rapidity on the usage of the Information and Communication Technology (ICT) in the community showed that the education system in this region is utilizing more of ICT in managing various challenges in the world's education system. Learning by design approach has the potential to be one of the most popular approaches among teachers to achieve the objective of children's learning. This article discussed three issues and challenges in implementing this approach – i) community's perception on digital games, ii) teacher's practices in implementing learning by design through digital games, and iii) children's level of creativity and skills in designing digital games for the learning process in the classroom. This article also discussed on the solutions for each issue to ensure the teaching and learning process could be stabilized to produce competitive and highly skilled digital generation.

Keywords: Children, Designing, Digital Games

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Introduction

Today's education system showed various methods and teaching techniques in achieving a more effective and meaningful teaching objectives. Some of the methods mostly used by teachers are demonstration, lectures, group discussions and tutorials. Effective learning could be achieved when teachers are intelligent and creative in planning teaching strategies that could improve students' readiness and motivation (Tomlinson, Brighton, Hertberg, Callahan, Moon, Brimijoin, Conover & Reynolds, 2003). Creative teachers are those who are able to deliver its teaching using numerous methods, techniques, teaching aids and experience in ensuring the knowledge delivered could be understood by the students effectively. Creative teachers would be able to expand intellectual power, spiritual, physical and emotions to their students optimally as aspired in the National Philosophy of Education.

Creative teachers are able to plan lessons strategically in choosing methods and teaching aids to attract students' attention. Effective teaching approaches could improve students' skills in accepting, analysing, and synthesising lessons to create new knowledge. Today's children are no longer depending on teachers. As teachers act as facilitators nowadays, teaching and learning approaches could be diversified. In their book, Roger and Freiberg (1994) also agreed with this.

“when teachers as facilitators of learning rather than mere givers of information, students are challenges to think for themselves. When teachers respect students as source of knowledge rather than consumers, students become engaged in the learning process.”

The above excerpt stressed on effective learning process through two-way communication between teachers and students. Teachers should give students the opportunity to self-learning with the teachers' guidance. There are multiple techniques and methods in implementing student-centred learning in the classroom such as project-based learning and problem solving.

In today's digital world, children are the generation who are exposed to the rapidity and development of the technology. They are deemed to possess natural talent in exploring technology (Maizatul, 2009). A few researchers found that one of the techniques and methods that could be practiced in the classroom is designing digital games (Baytak, Land, and Smith, 2011 – Kafai, 2006 – Prensky, 2008). Through student-centred learning, teachers act as facilitators in monitoring and evaluating the digital games that are produced. Moreover, learning by design is an approach that is used in multimedia education. This approach is believed to give students the opportunity to explore knowledge independently and enable them to share their experience with peers, teachers and parents (Maizatul, 2009).

Designing digital games is seemed as a foreign approach in the current teaching and learning environment. In this working paper, researchers will discuss three issues and challenges in implementing this approach –

- i) community's perception towards digital games
- ii) teacher's practices in implementing learning approach through designing digital games – and
- iii) children's level of creativity and skills in designing digital games for learning in the classroom

Children as Digital Games Designer

Multimedia application in education has opened a new dimension in diversifying methods and teaching and learning aids that could be use in the classroom. Children as students have the potential to apply technology and multimedia in developing their learning products. In developing a multimedia product based on new technology, Druin (2002) has listed four children's roles which are user, experimenter, information giver and designer's partners. However, many researchers had expanded the roles by including children as the designer of digital games. Kafai (2005), who is an active researcher in research related to technology and children, highly encourage children to act as designer rather than merely as digital games players. He believed that children are highly potential to determine their learning direction according to their own needs and expectations. Therefore, in recognising children's real potential in developing multimedia products such as digital games, children's role as designer who produce their own design (without the involvement of other individuals such as professional developer, programmer and designer) has to be observed and evaluated especially in the education field (Laili & Maizatul, 2013a).

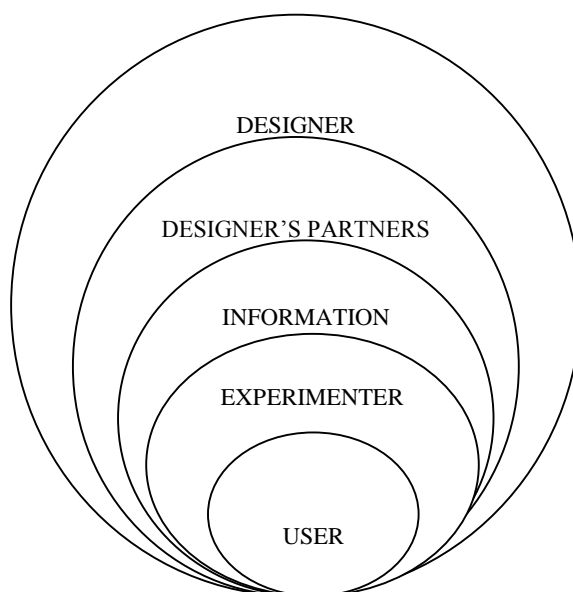


Chart 1 – Adaptation of children's roles in designing new technology (Druin, 2002).

In this working paper, researchers stressed more on children's role as a designer of educational digital games. Children's involvement as digital games designer give many benefits mainly for learning purposes such as below –

- i) Deep understanding towards learning that could be mastered through the games (Gershenfeld, 2011).
- ii) Increase in students' preparation and understanding to learn (Baytak, Land & Smith, 2011).
- iii) Twenty-first century skills that could be enhanced along with developing deeper knowledge (Kamisah&Nurul, 2013).
- iv) Students are free to explore self-learning or collaborative process (Robertson & Howells, 2008).
- v) Give students the opportunity to apply different learning styles (Lim, 2008).

Children are categorized as novice users without technical and programming knowledge in developing and designing digital games. Writing tools such as *Gamefroot*, *Scratch*, *Gamestar Mechanic* and *Scratch* are suitable to be used by children as they contain high usability and are interactive (Laili & Maizatul, 2013). These writing tools are easy to use and could be downloaded for free. Apart from accentuating creativity, children's skills could be trained to fulfill the needs of the 21st century.

Learning Approach through Digital Games Design

Approaches, methods, techniques and teaching aids for today's digital children generation must be different than the older generations. According to Prensky (2008), the way today's generation process information and thinking are far more advanced. Hence, the conventional approaches are not suitable to be practiced as learning content and technology develop rapidly. Learning by design is one of the student-centred methods that could give positive impacts in teacher's teaching pedagogy (Kalantzis & Cope, 2010).

The definition of learning by design from education multimedia perspective is based on constructivism theory that stresses on learning values through creation, programming or other activities that involve the process of digital design which could lead to meaningful learning (Han & Bhattacharya, 2001). In the context of this working paper, teachers could use learning by design approach by delivering the lessons and students could learn from the digital games that have been designed. Froebel agreed that learning process occur effectively in a fun situation where children could build, design and invent through play (Resnick, 2007). In addition, intrinsic motivation and deep learning strategies could be increased through this approach.

In the learning pyramid by the National Training Laboratories, it will be easier for 75% of the students to accept and remember the lessons through self-learning process (Alexandria, Virginia. Oblinger, 2004). This approach is also supported by constructivism learning theory pioneered by Papert (1991) in which learning become more meaningful when students actively build their own artifacts and share them with others. Moreover, Piaget in Baytak, Land & Smith (2011) also stated that students could build their knowledge independently during the designing process. In

the Digital Taxonomy Bloom adapted by Churches (2008), designing activity in invention category is the students' highest order thinking skill.

In integrating digital games in the classroom, Mclester (2005) stressed that the designing activity is the best method. This is supported by Rieber (2005) in his research that claimed most of the learning occurred during the designing process as compared to merely playing digital games. Teachers could use this access as teaching aids that link teaching content with games (Ash, 2011). Teachers also play important role in conducting this activity to ensure learning objectives could be delivered effectively. They have to ensure that the content, pedagogy, knowledge and technology used are well-balanced. Kamisah & Nurul (2013) listed three teacher's roles in using this approach successfully which are:

- i) Teacher as facilitator in exchanging knowledge in the learning process
- ii) Teacher as facilitator in learning across curriculum and transfer of skills and knowledge
- iii) Teacher as evaluator in the learning outcomes (Roberston & Howells, 2008).

Research conducted by Maizatul & Masuch (2007) showed children's abilities in expressing creativity, implementing original ideas as well as learn to think logically and structurally based on their environment by designing digital games. Lim (2008) and Prensky (2008) found that this approach could increase the socio-cultural aspect in the classroom. Furthermore, research showed that children have more opportunity to be creative and could feel the excitement in learning through exploration and new invention (Kamisah & Nurul, 2013; Laili & Maizatul, 2013a). Active learning environment and experience could encourage students to be interested and ready to learn. Through this approach, teacher should guide students in understanding concept from various perspectives to ensure their thinking expand dynamically. This could assist children in preparing for future challenges that are more challenging.

Issues and Challenges in Implementing Learning Approach through Designing Digital Games

Learning by design in the classroom requires special attention from teachers. Teachers have to plan suitable strategy that will be implemented and the technology that will be used to achieve the teaching objectives. There are a few issues and challenges that teachers have to face in implementing this approach.

Community's perception towards digital games

When talking about digital games, many of us would imagine shooting, racing, or odyssey games that portray violent and rough characters. This is not something new as the community is exposed to the negative implications of digital games. Negative perceptions among teachers and parents towards the use of digital games as one of the learning aids becomes one the reasons it is rarely used in the classroom (Rice, 2007). Moreover, there are some schools that are not able to accept the integration of digital games in the learning curriculum and proscribe its usage as teaching aids. This is due to the fact that the content of most digital games in the market is not

appropriate for teaching (Ertzberger, 2008). Digital games developers only focus on the commercial value rather than the content and pedagogy that are fundamental in educational products. In addition, there are less cognitive elements in the games that only emphasise on play (Hogle, 1996) and excessive entertainment (Okan, 2003) which cause students to not pay attention when studying. This factor will disturb the teaching and learning process.

In an effort to increase the effectiveness of digital games in the teaching and learning process, a few agencies such as Osaka University and UK Department of Trade and Industry Technology had conducted research on this matter. Even though the game-based learning approach had been introduced to the education system in developed countries such as America and Europe, it is deemed as inappropriate to be used in Asean countries because of cultural issues (Lim, 2008). The content of video games that are too open did not adhere to the norm and courtesy manners of the East community. Furthermore, the social and cultural structures that are practised by the education system are conventional which make it difficult for teachers to accept new approach and method in their teaching. Several developers have taken the initiative to introduce educational games. However, it did not receive great responses as they were uninteresting and players did not feel the same zest as when they were playing the common digital games. In his research, Ito (2008) depicted that most of the educational games are digitalized based on drilling that adhere to the conventional curriculum. Students may be interested in the games for the first time but they would not be able to focus on it for a long time and return to playing games. These types of constraints act as challenges in the implementation of learning by digital games design approach.

Teacher's practices in implementing learning by digital games design approach

Teachers' negative perceptions toward the use of digital games in the teaching and learning process also influence their practices in implementing learning by digital games design approach. They feel the activity of designing digital games is hard to conduct. This is because the teachers did not have adequate knowledge in digital games, the platform and softwares to design games (William, 2009). They thought that they need high computer literacy knowledge and skills to implement this approach. Although there are various writing tools that could assist novice users and children to design digital games, teachers gave excuses of not having the time to explore and learn it independently before they could guide their students.

There were teachers who wanted to apply the activity of designing easy digital games in their lessons. However, constraints in terms of limited infrastructure facilities such as computer labs, computers and software MEMBANTUTKAN their wish (Ertzberger, 2008). In Malaysia, this approach is difficult to be implemented due to lack of relevant subjects in the national education curriculum (Kamisah & Nurul, 2013). Most of the learning topics rarely focus on inventions such as the invention topic in the subject of Life Skills. Moreover, the inflexibility of time for the teaching and learning process limit the implementation of this approach (Ertzberger, 2008; William, 2009). Thirty minutes lesson for each subject is inadequate for teachers to finish the syllabus if they apply this approach. Hence, teachers are more comfortable to stick to the usual approaches and methods as long as the objectives of the lessons are achieved and the syllabus could be completed.

Children's level of creativity and skills in designing digital games

The approach that teachers use in the teaching process could influence students' learning styles. Creative and skillful teachers could create greater generation in terms of intellectual, emotional, physical and spiritual aspects. Communities often perceive and evaluate children's creativity and skills through art-related activities such as drawing and singing. In today's digital and globalised era, learning approaches that could generate creativity and improve students' skills could be widened to various techniques and indicators in line with the aspirations of national education. Playing digital games has been a norm for children yet designing digital games is something fresh for them. Most of them did not have the opportunity to design their own digital games because they were not given the chance to exhibit their creative and skills through this approach (Laili & Maizatul, 2013b). It is rare to see digital games that use children as its main source of idea in the designing process. Most researchers merely place children as players. If the children were given the opportunity to design, it is believed that they could show their capability in designing digital games according to their own idea and bring it to a more meaningful learning and transferable skills.

There are several indicators that are used to measure the creativity levels and skills in art and sport activities. However, the standard indicator to measure the creativity levels and skills in the use of technology in learning has not been identified (Joint Research Centre – European Commission, 2010). Even though many researchers use benchmark and rubric in evaluating their research, the measurement is not holistic and only focuses on the products and certain users. This made it difficult for teachers to evaluate the approaches that they use to achieve the teaching objectives and in guiding students to think creatively and become skillful.

Teachers should know their students' level of creativity and skills in the process of designing digital games to ensure the lessons could be maximized without any interruption related to technical or students' basic knowledge in designing digital games. In addition, this could prevent imbalance lessons between the bright and the weak. If teachers were not able to identify their students' potentials, the weak students will be left behind when the brighter students dominate the activity. Consequently, the teaching objectives would not be fully and effectively achieved.

Proposals in Implementing Learning by Designing Digital Games Approach

Researchers have proposed three alternatives that could assist in overcoming the issues and challenges in the learning by designing digital games approach.

Control the content of digital games for educational purposes

Digital games that are available in the market are different than the educational digital games use for learning in relation to content and pedagogy. The Ministry of Education (MoE) under the responsibility of Education Technology Department has to monitor more closely the content of digital games that are appropriate to be used in the classroom. Ibrahim and Jaafar (2009) stated that the two components that should be in educational digital games are educational component (learning theory,

learning styles and pedagogical aspects) and games aspect (challenges, rewards, objectives, spatial and mechanical aspects). Additionally, in his research, Prensky (2001) proposed that the content and games context should be separated in learning to ensure children feel that the educational video games are similar to other digital games. Although these two components are separated, they should be balanced to ensure the teaching and learning process could be done in harmony without any negative influence on the students.

Negative perceptions toward digital games need to be shifted through control and guide in evaluating the content of digital games for educational purposes. It is believed that the combination of expertise from teachers, researchers, and the industry practitioners of digital instructional and games design could produce educational games that are suitable to be used in the teaching and learning process. Apart from the suitability of the content of the syllabus, it should also be culturally appropriate. Characters and the environment could be design based on the local characteristics that are more decent and familiar to the students. This factor could increase the trust from the community especially from parents in applying the use of digital games inside and outside of the classroom. When the community perceives digital games as a positive medium, teachers could expand playful activity to designing digital games.

Supports from educators in implementing learning by digital games design approach in the teaching and learning process

21st century teachers are teachers who are equipped with informational knowledge such as science and technology, able to think creatively and innovatively as well as could inculcate values in students through their lessons. As a responsible individual in implementing the learning by digital games design approach, teachers should be fully exposed to basic knowledge related to digital games, technical and teaching guides. MoE and educators should consider this approach holistically as an effective learning approach in integrating Information and Communication Technology in education (Kamisah & Nurul, 2013). Training of Trainer that is held by school in collaboration with industry practitioners in designing digital games could give a more accurate exposure in implementing this approach.

Support from school in providing infrastructural facilities to teachers is crucial in implementing this approach. Facilities related to tools, places, and softwares could be discussed among teachers with the school administrators to get the allocation needed. It should not be a huge problem as this approach is not only appropriate to be used in the subject of Information and Communication Technology. Creative teachers could implement this approach in other subjects such as Mathematics, Science, and Languages as long as the pedagogical aspect and learning objectives in designing digital games fulfill the needs of the curriculum (Prensky, 2008). The reconstruction of the syllabus and teaching time have to be revised to ensure it is suitable for the 21st century education which include self-learning aspects and constructivism where teachers act as facilitators. Exposure through formal courses, mass communication, and electronic media could gain teachers' attention in using this approach to diversity techniques and teaching aids.

Children's creativity evaluation and skills in designing digital games

Teachers have to identify the strengths and weaknesses of each student to ease them in planning effective teaching strategy. They should not proceed in using the guides in implementing an approach without knowing the students' competence level. Before teachers implement the activity of designing digital games in their lessons, it is suggested that teachers see their students' potential in creativity aspect and designing process skills. They could use a range of appropriate instructional models such as ADDIE and ASSURE which are commonly used in integrating technology in education (Jamalludin & Zaidatun, 2000) as a guide in conducting this activity. In those models, teachers need to set the standards in evaluating students' level of creativity and skills in designing digital games that could meet the learning needs. The creativity of the children in designing and producing digital games for learning could be research empirically to examine its suitability and effectiveness. Teachers need to refer to the indicators that are used by famous figures and experts in creativity. For example, Paul Terrance, who is known as the father of creativity, has produced four indicators which are originality, smoothness, flexibility and clarity in his research set known as *Torrance Creative Thinking Test* (1987). The Ministry of Education has also outlined three main cores in 21st century skills which are i) learning and innovation skills, ii) informational, media and technology skills; and iii) life and career skills. Teachers could also refer to set or measurement checklist in rubric and scales related to digital games design. The measurement could be obtained from Internet and should be adapted according to the teachers' activity plan to ensure the teaching objectives could be achieved effectively through this approach.

Conclusion

Meaningful learning is influenced by conducive environment and effective teaching. Teachers play a vital role in the teaching and learning process in the classroom to ensure the teaching objectives could be achieved and improve students' achievement. Even though student-centred learning place teachers as facilitators, teachers need to be wise in planning activities that are systematic in a fun learning environment. One of the potential approaches in training students to self and independent learning is learning by design. The use of digital games in the teaching and learning process does not eliminate teachers' duties. In fact, teacher's role as a facilitator could strengthen this new approach in our education system. Challenges and issues that hinder the implementation of this approach could be solved through supports from various parties especially the Ministry of Education, school administrators, teachers, parents, and communities. Collaboration between teachers, researchers and industry practitioners could produce a guide related to procedures in implementing this approach for it to be used in our national education curriculum. The researchers believed that the learning by designing digital games approach could strengthen the education system in line with the technology development and advancement of the 21st century education.

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- Contact email:** maizatul@fskik.upsi.edu.my, m.nasir@fppm.upsi.edu.my, life_farhana@yahoo.com

Applications of Media in an ESL Environment

Rahul Sangar, Mahidol University International College, Thailand
Alexander Nanni, Mahidol University International College, Thailand

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Abstract

All too often, EFL programs focus on developing students' language ability without concern for providing meaningful content. A previous paper by Nanni and Sangar (2014) demonstrated a technology-based approach to addressing this shortcoming, a semester-long project that fosters collaborative learning and integration with the wider community. This project has since evolved, and continues to work in the confines of an EFL program at a Thai University. One of the developments was in the area of collaborative process, which was modified to make student groups smaller and more efficient. This has led to a higher-quality project being delivered by the students. Another evolution of the project involves the recognition of the student's work through a designated YouTube channel. This increases their motivational levels, and the quality of work presented has improved over the year. Furthermore, the project has proved effective in reducing plagiarism, as the students must appear in the videos that they produce. The underlying theme of the project continues, which is the advancement of student language skills through the use of social media platforms and also being engaged citizens of the ASEAN community. In this paper, two teachers involved in designing this project will provide and discuss the results achieved through its implementation.

Keywords: EFL; Citizen Journalism; Social Media; News; E-learning; ASEAN

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Introduction

This paper presents the ongoing results from a media-based project developed at the Preparation Center for Languages and Mathematics at Mahidol University International College. The Preparation Center, also known as PC, offers an intensive English and mathematics program for students who wish to enter Mahidol University International College (MUIC), which is an English-medium liberal arts college within Mahidol University. The Center's mission is as follows: "to provide educational experiences which cultivate students' academic English communication skills; to foster their ability to be self-reflective and responsible learners; and to stimulate their curiosity about the world." This ethos not only prepares students for their life at MUIC but also for their future careers beyond university.

There are four levels at PC, ranging from lower intermediate (PC1) to upper intermediate (PC4). The media-based project is taught to intermediate-level EFL students who are in PC2. The objectives of PC2 require students to speak about unfamiliar topics with a reasonable level of confidence using complex sentences. Students also have to develop as young adults; maturity and responsibility are encouraged. Their writing skills are developed to the point where they can construct an essay with a clear opinion. Furthermore, their understanding of their regional environment is also developed by raising awareness through current affairs.

The PC2 project incorporates several of the above objectives and emphasizes awareness of the broader world, specifically ASEAN (the Association of Southeast Asian Nations). Such awareness is critical as the AEC (ASEAN Economic Community) will integrate at the end of 2015. The project cultivates regional awareness by requiring students to create a six-minute news bulletin in English. The bulletin is about an ASEAN country, and it compares issues that relate to their chosen country and to Thailand. To create the bulletin, students must utilize news-gathering skills and apply social media tools.

This is a new project that encourages critical thinking, enabling students to increase their awareness of regional events while developing their English skills, thereby upholding the values that are the foundation of the liberal arts program at MUIC. The approach incorporates aspects of media journalism, such as research, appropriate content, story structure, camera technique, shot selection, writing, and editing, as well as aspects of citizen journalism.

Citizen Journalism

The role of journalism continues to evolve as technology gives more people access to information and opinion. The traditional role of journalists as guardians of truth and those who check the power of authority has evolved. People without a journalism background also have taken up these roles through citizen journalism. They "have emerged as the vanguard of new social movements dedicated to promoting human rights and democratic values" (Radsch, 2011, p. 61).

According to Bowman and Willis (2003, p. 9) citizen journalism is the “act of a citizen, or group of citizens, playing an active role in the process of collecting, reporting, analysing and disseminating news and information, in order to provide independent, reliable, accurate, wide-ranging and relevant information. This suggests that in today’s world where technology abounds and is increasingly accessible, everyday people can now take an active role in disseminating information and rebroadcasting it through various media platforms, without the professional rigour required by traditional journalists. Now, meaningful journalism is no longer conducted solely by professionals. Civic-minded individuals are also able to produce and distribute meaningful content: “In many respects, citizen journalism is simply public journalism removed from the journalism profession” (Barlow, 2007, p. 181). The traditional media of newspapers, TV and radio have taken time to incorporate this phenomenon. No longer do audiences just digest news from news organizations. They want to interact, they want to provide content, and they want to be involved in their community, whether local, regional, national, or global.

Cooperation between traditional media and citizen journalism also exists. One example of citizen journalism and traditional media melding to allow people to share opinion and help change society is the approach taken in India, where in 2005 the Cable News Network-Indian Broadcasting Network (CNN-IBN), an English-language Indian television news channel, enabled “the citizens of India a platform to articulate the issues concerning them, like corruption, politics, education, health, society, so on and so forth. The trend was later followed by several other media organizations” (Noor, 2012, p. 4). This is not an isolated example. As integration of user-generated content becomes commonplace, it is increasingly evident that “engagement and collaboration with the audience should not be considered an afterthought but rather an integral component of a brave new world” (Duffy, 2011, p. 21).

Citizen journalism has enabled ordinary citizens to express their opinions, in turn empowering them to effect change. In part, the power of citizen journalism springs from the absence of strict editorial guidelines. Another source of citizen journalism’s power is the ability to deliver a collective message. Citizen journalists include teachers, businessmen, farmers, and students — people who are “not bound by the conventional term of a journalist” (Noor, 2012, p. 5). Their messages resonate with the public as they come from ordinary people.

This emerging form of journalism is creating a challenge for traditional media outlets as it enables communities in a local, regional or global context to have a voice and not to be sidelined by media organizations that may have vested interests. Citizen journalists often have much more personal investment in local stories than traditional journalists. They are also typically less motivated by profit. These factors can result in a more accurate portrayal of local events. It has been suggested that citizen journalism is “promising a scenario of breaking free from media bias as well as taking local news on a global platform” (Noor, 2012, p. 6).

One of the key outcomes of citizen journalism is empowerment. Now other major news outlets incorporate new media to enable citizen journalists to express their point of view. There are programs on traditional media broadcast sites that discuss the concept of citizen

journalism, including BBC (*Citizen journalism 6minutes English*, 2011) and PBS (*Your guide to citizen journalism*, 2006). These examples highlight that the use of new technologies will empower citizens to participate, explore, and learn. They will be empowered in terms of both expression and self-confidence. Citizen journalism is the way of the future, and its application in a program geared towards preparing students to enter a liberal arts college seems a natural step. An understanding of the issues where one lives and the skills to express this understanding are critical both in citizen journalism and in liberal arts education.

The Project

The media-based project described below was previously presented in “At One with ASEAN: Connecting Students Through a Collaborative Media-Based Project,” which was published in the proceedings of the Asian Conference on Technology in the Classroom 2014 (Nanni & Sangar, 2014). Since its inception more than a year ago, the project has undergone several significant modifications. That being said, the premise of the project still remains the same: to engage students about the broader world, in this case ASEAN.

The project runs over a ten-week period, and students can choose to either work in pairs or individually. Most choose to work in pairs, where they divide the roles of producer, presenter, and editor. The roles help to develop different aspects of EFL learning. The producing role involves creating the story and providing the research, the presenting role develops speaking and listening skills, and the editing role helps with the overall comprehension of the story and formatting the story in a logical and chronological order. The students not only develop their language skills, but also develop their technology skills, applying basic camera techniques and shot selections as well as video editing and post-production.

The students are advised by teachers, who play the role of executive producer. On a regular basis over the ten week period, students’ progress is assessed to make sure they are achieving the objectives of producing a six-minute news and current affairs segment. The teachers advise students on basic shot selection and issues of lighting and sound. Students, however, learn quickly through the process of inquiry and curiosity as to what works best. Their source material is from traditional media sources (e.g., TV and online newspapers) instead of blogs.

The students research their topic, which could focus on anything that is newsworthy, including politics, business, sport, tourism, health issues or human rights issues. They then have to research and write a 550-word essay on their topic of interest and use the essay to develop their scripts for their on-air presentations. The speaking component of the project is based on their scripts as well two short interviews. In the interviews, students ask experts, such as PhD students or professors, questions that are relevant to the ASEAN country that they chose. The final package is edited using software available on the Internet and then presented to the class.

Previously, students worked in groups of three, and all members of a group received the same grade. Many students felt that responsibilities were distributed unevenly, and some

felt this was unfair. Student comments reflected this: “I think this should be individual work not because if I do the project better than my partner, she/he will be my burden. On the other hand if my work is worse, I will be his/her burden too” (student comment from 2014 survey). Other students preferred to work with their own friends rather than work in teams assigned by the teacher: “It is individual work I did not do it with my team, I did it with my close friends in class” (student comment from 2014 survey). The project has now been modified to allow students to work in pairs or as individuals. If students choose to work in pairs, they are able to choose their own partners. Teachers now assess the projects individually, and the feedback from the students has been far more positive.

New media is primarily used in the forms of Facebook, Instagram and other similar media platforms mainly designed for social interaction. Incorporating new media and the concept of citizen journalism expands the students’ horizons as to what is happening outside of their immediate social circle on to a broader platform, yet still utilizes new media tools and skills. Through this process of inquiry, the students develop citizen journalism skills but more importantly their language skills.

The students also receive recognition for their efforts. Teachers nominate the best videos in each class. These videos are shown to all of the PC2 students, who vote to select the best videos. The news stories that are of the highest quality are recognised during the orientation day ceremony the following term and played in front of prospective students and their parents. They are then posted on a YouTube channel, where students can comment on the videos as well as share their efforts with their friends, thereby incorporating the social aspect of new media as well as displaying both their skills as citizen journalists and as EFL students.

Outcomes

Overall, the results of the media-based project have been positive. In January of 2014 and again in January of 2015, students completed a nine-question survey about their satisfaction with the project. The survey used a seven-point Likert scale, where 1 was deemed “completely disagree” and 7 deemed “completely agree.” In 2014, a total of 27 students were surveyed, and in 2015 a total of 69 students completed the survey. The level of enthusiasm for the project increased markedly over a one-year period, with the average score about the level of interest in the project increasing from 4.72 to 5.10. Overall, the trend was upwards over a 12-month period with the average score on all questions rising from 5.10 to 5.32. The most significant increases occurred in the area of awareness and understanding of current events in the ASEAN region. The average response to the question about whether the project helped students learn about ASEAN increased from 4.86 to 5.38, and the average response to the question about whether the project helped students learn about current events increased from 5.00 to 5.76. The level of interest in current events also increased from 4.59 to 5.24.

Students also showed great initiative by providing an online tutorial on how to record quality audio (May, 2014). This exemplifies how new media and social media are being utilized not only to develop students’ language skills but also to increase their acquisition of knowledge.

One downward trend was the question about whether the project helped develop teamwork. This was rated at 5.55 in 2014 and decreased to 4.86 in 2015. Perhaps this was a result of the modifications to the project where students could choose to work in pairs or as individuals. This result suggests that in the future the project may be best suited for individual rather than group work.

The PC2 project...	Avg. Q1 2014	Avg. Q1 2015
... was interesting.	4.72	5.10
... helped me to learn about ASEAN.	4.86	5.38
... helped me to learn about current events.	5.00	5.76
... helped me to meet other students in my class.	5.21	5.28
... helped me to improve my study skills.	5.10	5.28
... helped me to meet other people outside of my class.	5.48	5.45
... helped me to learn to work as a team.	5.55	4.86
... helped me to get better at using technology.	5.38	5.55
... helped me to become more interested in current events.	4.59	5.24
Average overall:	5.10	5.32

Figure 1. Results of survey about media-based project.

The key benefits that students seem to gain from the project are an increase in the use of technology, improvement in their EFL skills, and a greater awareness of their region. In this sense, the project is achieving its goal of using citizen-journalism skills to further develop EFL skills while increasing the awareness of the students' knowledge of current issues in the ASEAN region.

Students sharpen their speaking skills through the news reports and interviews, listening skills through the interviews with experts, and writing skills through preparation of their 550-word essay. The assessment is made clear through the grading rubric provided on the students' website. The rubric clarifies how students are assessed and provides guidelines for creating their work.

The comments from the students reflect the overall increases in the positive responses from the students as well: "PC2 project helped me learned more vocabulary and interesting fact about the ASEAN country I did project about" (student comment from 2015 survey). There were also positive responses on how the project helped students improve their English: "PC2 term project prove to be effective way for students to improve their English communication" (student comment from 2015 survey).

The media-based project is comprised of activities that are hard to plagiarise. Many students took a copy-and-paste approach to completing previous projects, with no genuine attempt to disseminate information and deliver this information in their own words. To complete this media-based project, students must cite recent news sources. They cannot copy papers from previous quarters as one of the prerequisites of any news story is that it has to be up to date and relevant. Furthermore, the requirement that students appear in the videos that they produce limits the amount of work that could be done by a ghostwriter.

Conclusion

This paper has described an application of the principles of citizen journalism to an EFL course. It is important to note that the course does not aim to be a journalism course but rather uses basic tools and skills required of journalists to better students' English. That is, the Preparation Center for Languages and Mathematics is not attempting to create journalism students per se but to use the fundamentals of journalism to better prepare students to enter an English-medium university program. The rigours applied to basic journalism are still the same: factual sources, grammatically-correct language, and informative yet thought-provoking stories.

Authenticity of learning is the aim of the project. Truly authentic learning must look beyond the classroom: "The materials and activities of the learning environment reflect or recreate some aspect of the world outside of school [A]uthentic activity includes anything that works" (Shaffer & Resnick, 1999, p. 198). In this case, the synergy between citizen journalism and language learning creates opportunities for students to develop their language, technology, and media skills through real-world applications.

The logo for 'iafor' is centered on the page. It consists of the lowercase letters 'iafor' in a light blue, sans-serif font. The text is surrounded by several overlapping, semi-transparent circular arcs in shades of light blue and light red, creating a dynamic, swirling effect.

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An Analysis of Weblogs' Grammatical Errors of Filipino Learners of English as Second Language

Romualdo A. Mabuan, Lyceum of the Philippines University, Philippines

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Abstract

This study investigated grammatical errors in a corpus of 58 blog posts written by 58 participants through weblogs. It aimed to determine the views of students on the use of blogs in facilitating the acquisition of English writing skills, to identify, categorize, and analyze grammatical errors in students' blog posts, and to explore students' perceptions on the advantages of blogging as an alternative writing platform. The participants were freshman university students enrolled at a Study and Thinking Skills class at Lyceum of the Philippines University – Manila during the first semester of the academic year 2014-2015. Research data come from students' blog posts, survey, and focus group interviews. Errors were first classified into seven major categories and then they were divided into subcategories. Results show that the most pervasive errors committed by the participants were tenses, subject-verb agreement, prepositions, morphology, articles, verbs, and pronouns. Pedagogical implications for teachers, syllabus designers, textbook writers, and text developers were offered on the basis of these results.

Keywords: blogs; blogging; weblogs; error analysis; error analysis of weblogs

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Introduction

Blogs, Blogger, Blogging

Blogs (short for “web logs”) are free, manipulable, and personalized online websites that look like a journal or diary. Blogs are easy-to-use and easy-to-maintain websites which allow a blogger or a blog user to create, edit, and publish written outputs called blog posts into the blogosphere (blog community in the cyberspace) through a blog platform, which is a free web hosting service (Campbell, 2003). Blogs can be used for personal, social, entrepreneurial, and educational purposes.

Blogs are popular but not necessarily new. They have been existing for 23 years now since their introduction into the World Wide Web in 1991 as a mode of sharing information. Early blogs had three primary features – contained links to other areas of interest in the web, commentary on the links, and interactivity and interconnectedness (Li & Chignell, 2010). Blogs have gained popularity since free hosting websites such as *Blogger.com* introduced itself in 1999, fostering a rapid growth of blog sites (Blood, 2000). In fact, blog ranked first in the “10 tech trends to watch in 2005” in the cover story of the first issue of *Fortune* magazine in 2005. “According to blog search-engine and measurement firm Technorati”, *Fortune* reports, “23,000 new weblogs are created every day – or about one every three seconds” (p.34). Requiring little or no technical background from users to create, design, and maintain, blogs have become a viable tool for online publishing from personal to business purposes.

Nowson (2006) defines blogs as web pages frequently updated with posts in reverse chronological order and the language used is informal and less constrained. It provides freedom to the blogger to write and publish absolutely anything about everything, at anytime in anyplace as long as there is an internet connection. Blogs are medium for dialogs between bloggers and readers, readers with other readers, and bloggers with other bloggers and their readers (Ferdig & Trammell, 2004). This authentic, interactive, and communicative environment qualifies blogs worthy of integration in the modern language classroom.

Campbell (2003) states that there are three types of educational blogs which educators can utilize in incorporating this technology into their classrooms: the tutor blog, which is created and maintained by a teacher; the learner blog, which is individually owned and updated by the members of a class; and the class blog, which is co-owned and co-operated by both the teacher and the students. Blogs, according to Campbell, affords students reflective learning in the process of developing an online portfolio that indexes all their learning outputs from their respective classes.

From Technology to *Teach-nology*: Blogging for Language Classes

With the upsurge of modern technologies, educational thought-leaders and policy-makers have continually strived to harness the potentialities of these technologies for classroom integration. As a result, various educational trends surfaced: Computer-Assisted Instruction (CAI), Technology-Enhanced Language Education (TELE), blended learning, digital learning, and so on. There is a growing awareness to recognize the nature of a modern learner, a ‘digital native’ (Prensky, 2001), who is adept at manipulating modern technologies in his day-to-day existence. Educators can

no longer deny this fact, and should therefore shift their teaching paradigm and admit that they can no longer teach their students the way they were taught before.

There is a gamut of modern technologies that teachers can utilize in their classrooms: blogs, wikis, podcasts, video-casts, blackboards, storyboards, and many more. Most of these applications and programs are free and easy to use, which makes them very practical for classroom use. This study explores the viability of one of these technologies: blogs. Because blog features its easy-to-use interface, frequent text update, and interactive comment area, most educators applied their blogs to reading or writing classes (Johnson, 2004; Campbell, 2003). These interactions expose learners to authentic uses of the target language which can inspire and challenge them in ways that classroom experiences cannot (Campbell, 2005). Studies (Saeed, 2009; Wang & Woo, 2008) have suggested that through blogging, students can organize information, post and share written outputs, give and get comments from other students, search information, link to other students' sites, read and evaluate other students' posts, collaborate and learn from one another, exercise learner autonomy, develop confidence, and reinforce motivation.

Existing studies and reviews on the use of blogs in second language learning and language learning include: blogs as a pedagogical tool in the classrooms (Richardson, 2009); blogs as an educational platform for ESL learning (Abu Bakar, 2009 as cited in Johnson, 2004); blogs as a learning material and learning process (Ferdig & Trammell, 2004); blogs as a tool for reading and writing (Wells, 2006); blogs as a way to foster a feeling of community between the members of a class (Soares, 2008). These studies suggest that blogging can be exploited to cater to different educational purposes aimed at enhancing the learners' language learning experience.

Furthermore, blogging can induce, as what Nagel and Anthony (2009) regarded a "therapeutic intervention" as it allows learners to release their feelings and emotions, which may lead to "an immediate feeling of relief and initially increase a person's ego or strength", thereby boosting students' affective domain, making them perceive writing not as a dreaded activity. This strengthened what Daiute (1986, p. 3 as cited in Soares, 2008) wrote that "...one of the main observations has been that students of all ages find writing on computers and communicating in the cyberspace to be highly motivating – an attitude that has not been reported regarding traditional writing instruction environments."

Investigating Grammatical Errors in Students' Writing via Blogging

Error Analysis (EA) is a type of linguistic analysis that is concerned with the errors learners make. It consists of a comparison between the errors made in the Target Language (TL) and that Target Language itself. Pit Corder is considered to be the forerunner of EA. Errors used to be perceived as "flaws" should be eliminated. Corder (1971) gave a different perception of these errors by considering them as "important in and of themselves" because errors shed light on the learning process. In the same vein, Gass and Selinker (1994) define errors as "red flags" that provide evidence of the learners' knowledge of the second language. Researchers are concerned with errors because they reflect and reveal the strategies that people use to acquire a language (Richards, 1974).

Errors can be interlingual or intralingual. Interlingual errors are attributable to the native language (NL). They occur when the learner's L1 habits (patterns and systems) interfere and prevent them from acquiring patterns in the TL (Corder, 1971). In other words, interlingual errors are the result of a negative transfer from the mother tongue (L1) to the TL. Interesting enough, investigating errors has both diagnostic and prognostic aspects. It is diagnostic because it discloses the learners' state of the language at a certain level during the learning process. It is prognostic because it can inform course organizers to restructure language learning materials in the light of the learners' current problems (Corder, 1967).

In the present study, Ellis' (1985) Error Analysis framework was utilized to identify, classify, explain, and evaluate students' grammatical errors in their blog posts.

Research Question

A class blog project was carried out in this study in order to fulfil the following objectives:

1. to determine the views of the students on the use of blogs in facilitating the acquisition of English writing skills;
2. to identify, categorize, analyze, and evaluate grammatical errors in students' blog posts; and
3. to explore students' perceptions on the advantages of blogging as an alternative writing platform.

Significance of the Study

This study is an attempt to incorporate technology in the English language classroom. Integrating technology into an educational setting affords both the teacher and the students to enhance their teaching and learning pathways. This educational endeavour provides insights to educators and researcher the viability and potential benefits of blogging in the ESL classroom and other subject areas. Furthermore, this supports student-centered approach in teaching as it recognizes and capitalizes on the characteristics of this generation's modern 'digital' learners.

Methodology

Participants

The participants involved in this study consisted of fifty-eight (58) freshman college students (16 males and 42 females; ages range from 16 to 20 years old) enrolled in Study and Critical Thinking Skills, from two degree programs, BS International Hospitality Management (major in Hotel and Restaurant Administration, Culinary Arts and Kitchen Operations, Cruise Line Operations in Hotel Services, and Cruise Line Operations in Culinary Arts) and BS International Travel and Tourism Management, in a private tertiary institution in Intramuros, Manila – Lyceum of the Philippines University. They have an average English learning experience of 10 years, and their English proficiency levels at the time of study ranged from lower intermediate to intermediate based on their TOEIC (Test of English for International Communication) scores, which was administered by the university in the beginning of the semester. The course uses an integrative approach which caters to the learning and

acquisition of all English macro skills, i.e. listening, speaking, reading, and writing. Each class session ran for one and one half hours with two sessions per week. This study was conducted during the first semester of Academic Year 2014 – 2015, from July 7 to August 9, covering five weeks.

“The Blog Project” was announced to all classes as a midterm project to ensure that all students would participate in blogging. Initially, seventy (70) students created a blog account; however, only fifty-eight (58) continued with the project, for the six discontinued doing it after a week, the three officially dropped after the preliminary term, and the remaining three failed due to excessive absences.

Prior to the conduct of the study, participants’ “virtual profiles” were checked by identifying the social networking sites that they maintain. The survey revealed that the three most popular social networking sites among the initial 70 respondents are *Facebook* (70, 100%), *Twitter* (44, 63%), and *Instagram* (35, 50%). In a day, they access their social media for at least an hour (14, 20%), more than an hour but less than five hours (21, 30%), and more than five hours (35, 50%). Their social media activities include posting, reading, and commenting on their and their friends’ status updates, chatting, uploading photos and videos, and sharing information. Furthermore, when asked whether they have heard about blogs, they responded as follows: No (11, 15.7%); Yes, but no idea what it is (24, 34.3%); Yes, but have a slight what it is (27, 38.6%); and Yes, and have a blog (8, 11.4%). This supported the initial premise that the respondents were technologically-savvy and hence were considered ‘digital natives’ (Prensky, 2001), establishing their readiness to participate in the project.

Research Instruments

To gather pertinent data for this study, the following research instruments were utilized.

Survey

Two surveys were administered to the respondents. Prior to the implementing of the project, a ‘pre-project’ survey questionnaire was administered to the respondents to gather personal information and to determine their exposure to technology particularly social networking sites. The responses from this questionnaire were used to organize the project in terms of what blogging platform to utilize, how much blogging the learners should do per week, what topics should be included, and how much background knowledge learners had of blogs. A ‘post-project’ open-ended survey questionnaire was administered to the participants to determine their perceived advantages and disadvantages of the blog project as an alternative writing platform, as well as their reactions to peer feedback online. The responses to the questions were posted as reflections on the blog project.

Interview

After the project was completed, 10 students volunteered for a group interview with the researcher to discuss the blog project. Open-ended interview questions were asked of the students to determine their perceptions on the benefits, limitations, and

challenges encountered in blogging. These responses were recorded by the researcher in order to determine how students viewed the project, whether or not the students would continue blogging in the future, and how, according to the students, could the project be improved.

Procedure of the Study

The Blog Project commenced in the First Semester of AY 2014 – 2015 after seeking consent from the students and their parents/guardians. As aforementioned, a pre-project survey questionnaire was administered to the participants. The project ran for five weeks with two sessions per week for one and one half hours per session.

Prior to the implementing of the project, the researcher identified the platform or blog site which would be utilized by the class, taking into consideration Soare's (2008) recommendation that teachers who would like to implement blogging in their classes should have "trial blogs before using the 'real thing' with students, checking if the platform chosen caters for all the wants and needs." The researcher set some basic criteria before deciding on the blog site to be introduced to the class: a) User-friendliness (the site must be easily navigable and must require only basic technical skills from setting up to publishing so that the students will have more time for blogging), b) customizability (the site must contain interesting features for the students such as access to free themes, formats, layouts, and integration of widgets, comment sections, and photo and video blogging), and security (the site must secure by providing students username and password for blog owner's access, as well as security codes for comment posting and preventing of unsolicited posts or comments). Shortlisted among these platforms based on the set criteria were *Blogger* (www.blogger.com), *Multiply* (www.multiply.com), *MySpace* (www.myspace.com), *Tumblr* (www.tumblr.com), and *WordPress* (www.wordpress.com).



Figure 1. *Blogger* (www.blogger.com) as the platform for The Blog Project

Being an active blogger himself for five years, the researcher tested all the shortlisted blog sites and finally decided to use *Blogger* as the platform for the project. Furthermore, to keep track of students' blog posts without manually visiting every individual blog, the researcher used *Bloglines*, a web-based service news-feed collector (also called 'aggregator') which enabled him to subscribe to the RSS (Real Simple Syndication or Rich Site Summary) feed of each of the students' blog, allowing him to read all of the students' blogs in one site from any computer connected to the Internet. Upon downloading and installing the 'notifier', the researcher was 'notified' whenever the subscriptions have new items to read. This aggregator also helped the researcher organize blogs by students' real names rather than pseudonyms.

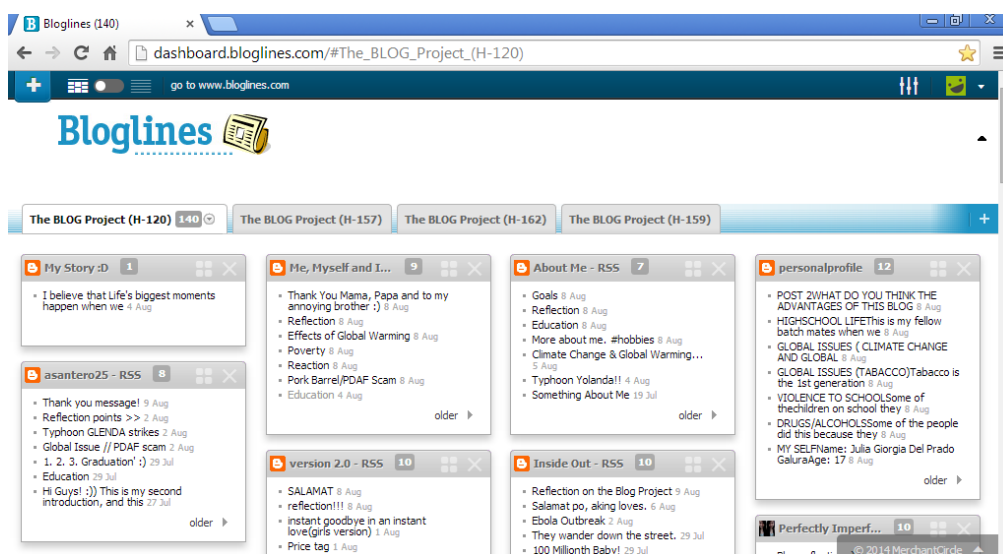


Figure 2. A screenshot of RSS feed reader from *Bloglines.com*

The researcher demonstrated to the class how to set up a *Blogger* account, how to use the *Dashboard* to post blogs, how to edit, how to change themes and layouts, how to integrate photo and video blogging, how to publish posts, and finally how to comment on each other's blog posts. Peer feedback was stressed to be relatively important and was required for all, and guidelines and examples were given. Moreover, the objectives and guidelines of the project were presented to establish adherence and to achieve the desired outcomes. Students were encouraged to publish two blog posts per week related to the general topics provided: Personal (Week 1), Educational (Week 2), Societal (Week 3), Global (Week 4), and Reflective (Week 5). Grade incentive as a form of extrinsic motivation was also utilized to reinforce compliance with the project among the students. The researcher asked the participants to post their blog sites on the class' *Facebook* 'closed' group account. From there, he 'visited' their sites and subscribed to their RSS feeds through *Bloglines*. The *Facebook* group account where all blog sites of the students were posted served as the 'venue' for students' access to their classmates' blogs for reading and commenting of posts.

The researcher monitored all the blog posts of the students closely through *Bloglines*, and he consistently motivated and reminded them to keep on blogging and posting of comments every time the class met, while addressing some specific concerns

encountered by the students. Several reminders were also posted on the class' *Facebook* group account.

After the project completion, a post-project survey questionnaire was posted online, and students were asked to accomplish it through posting their responses to the questions in their individual blogs. The researcher collected these responses for analysis. Afterwards, a focus group interview was conducted with the 10 volunteer respondents to determine their perceptions on the benefits and limitations of blogging, as well as their general comments on the blog project. Their consent was solicited to record the interview, assuring them of its confidentiality and anonymity. Open-ended questions were asked like: *"How would you describe your blogging experience?" "Do you think writing online through blogging helped you improve your English skills particularly writing? If yes, could you cite some of these improvements?" "What did you learn from this blog project?" "What were the challenges that you encountered while doing the blog project?" "Did you like/enjoy the project? Why or why not?" "How can this project be better?" "Would you continue blogging?"*

Finally, using 58 self-introduction essay blog posts, common grammatical errors committed by the students were identified, classified, and analyzed. These errors provided the researcher feedback on how the students have progressed, what remains for them to learn, and how the teacher can employ effective strategies to address these errors.

Data Analysis

To find out the students' reaction to the use of blogging as an online writing platform and their perceived advantages of it in developing their English skills particularly the writing skills, their blog posts were collected and quantified, and the survey questionnaire responses were coded and analyzed. Interview results were qualitatively described to validate these findings. Furthermore, common grammatical errors committed by the students in blogging as reflected in their blog posts were identified, categorized, and analyzed to determine trouble-spots in writing to gain insights for more effective teaching of writing practices.

Results and Discussion

Throughout the five-week implementation of The Blog Project, the researcher gathered important data as regards the quantity and quality of blogs posted and the perceptions of student bloggers on writing online through blogging as an alternative writing platform.

In terms of the quantity of blog posts, the 58 participants who complied with the project published a total of 418 blogs online within the duration of five weeks, with an average of 83.6 posts per week. Among these blogs, the maximum number of words is 1,956, while the least number of words in a blog is 20. On the average, blogs are composed of 319.67 words. These figures showed the pedagogical potentialities of blogging as to its effects in motivating learners to freely express their ideas, emotions, and opinions through online writing. Despite having no 'strict' guidelines in blogging such as paragraph structures, style, and word limits, and despite the absence of any evaluative measure or grading system for each of the blog post, it can be seen that

students manifested significant interest in writing and posting blogs. While this can be attributed to the blogging being introduced as a ‘midterm project’, it cannot be denied that students showed motivation and enthusiasm in writing through the frequency of their posts and the quantity of words for each post. Furthermore, it should also be noted that students did not only use text blogging; they also incorporated photo and video blogging as well as hyperlinking to their classmates’ blog sites and other websites. This implies that blogging provides interesting features that promote students’ enthusiasm for writing, creativity, and collaboration.

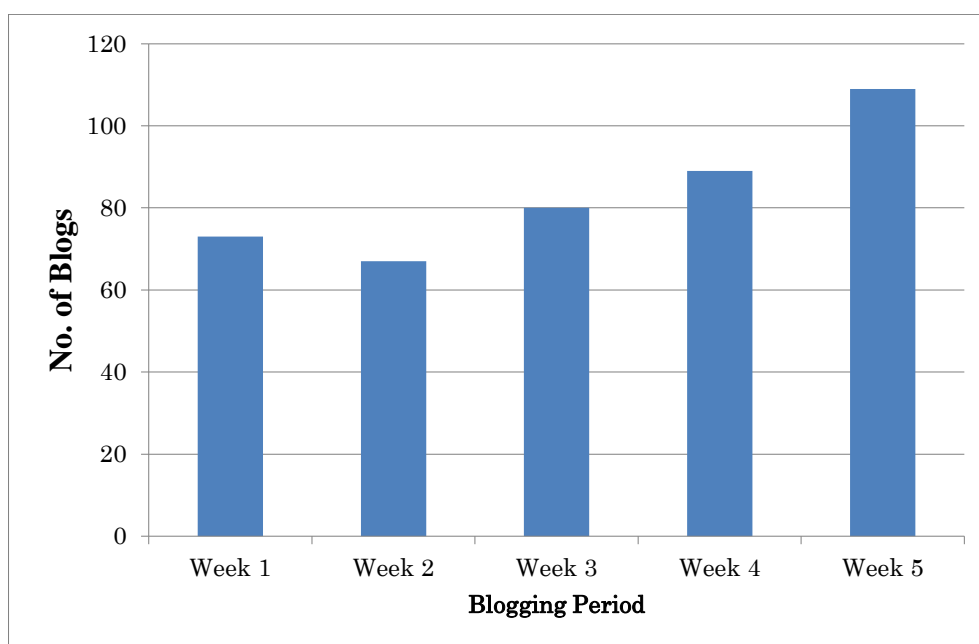


Figure 3. Blog count per week

Figure 3 presents the blog count for each week. This data shows an upward movement from the onset of the project. On the Week 1 of The Blog Project, 73 (17.46%) blogs were posted, showing the project’s wide acceptance among students, despite some complaints of lack of sufficient knowledge on blogging, having no technological resources like personal computer and internet connection at home, and poor or unstable internet line connection. Some students also reported having created their blog sites where they posted their blog entries, but were hesitant to post the link on the class *Facebook* group account due to ‘shyness’ and ‘fear of criticism’. However, it should be noted that these ‘inhibitions’ were gradually eliminated as the project progressed.

There was a slight decrease of the number of posts for Week 2 (67 blog posts, 16.03%). This can be attributed to the busy schedule of the students in preparation for their Preliminary Examinations, which brought a growing number of school tasks and projects to attend to. However, after Week 2, a consistent upward trend is remarkably noticeable from Week 3 (80 blog posts, 19.14%), to Week 4 (89 blog posts, 21.29%) and to Week 5 (109 blog posts, 26.08%) when it reached its peak. This may be due to the consistent motivation and encouragement given to the students, increased learning and adaptability of the technical know-how of blogging, and growing interest of the participants upon seeing their classmates’ posts and comments to one another. This

strengthens the claim that blogging is not merely a writing activity but an avenue for learning new things and for sharing experiences, ideas, and information.

In terms of the quality of the students' blog posts, the researcher observed varied but relevant responses to the five general topics provided. Though students were always reminded to pay attention to the unity, coherence, cohesion, grammar, vocabulary, and organization of their blog posts before publishing them, common grammatical errors surfaced. Table 1 shows the identification of grammatical errors based on the type of errors, frequency of errors, and percentage of errors committed by the students in writing their blog entry number one which is a self-introduction essay. The researcher analyzed 58 blog posts, totalling 27,754 words, with an average of 296.49 words per blog.

Types of errors	Frequency	Percentage
Tenses	70	25.36
Subject-Verb Agreement	55	19.93
Prepositions	49	17.38
Morphology	39	14.13
Articles	27	9.57
Verbs	25	9.06
Pronouns	11	3.90
Total	276	100

Table 1. Identification of grammatical errors

The results show that the most common grammatical errors that the students made were in tense (25.36%), subject-verb agreement (19.93%), prepositions (17.38%), morphology (14.13%) followed by articles (9.57%), verbs (9.06%), and pronouns (3.9%). These results are graphically represented in Figure 4:

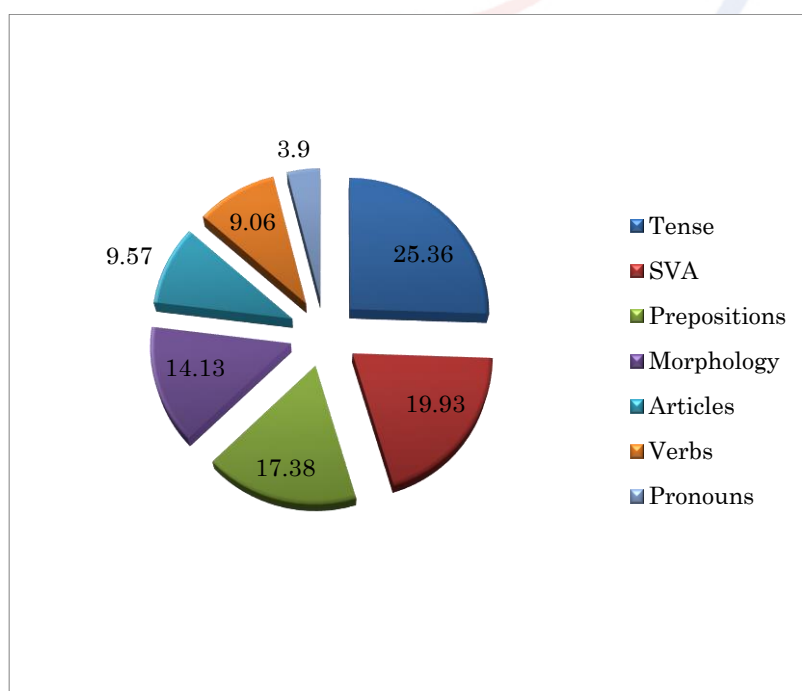


Figure 4. Identification of grammatical errors

As can be seen from these results, the most problematic area in grammar among the students is the verb tense. Wrong application of verb tenses can be seen when the participants did not apply the correct tense to the verb in the sentences. Students had problems with the use of bare infinitive after modals, the use of the simple present tense when the context is in the present, and the use of simple past tense to refer to actions completed in the past. Darus and Ching (2009) contend that it is not surprising that L2 learners face problems with tenses since English notion of tense is somewhat confusing to the L2 learners who regard time as a separate entity by itself.

The second most common type of error committed by the students is the error in subject-verb agreement. Students seemed not to master the syntactic rules of providing singular verbs for singular subjects and plural verbs for plural subjects. It was observed that the major cause of this error is students' confusion in locating the subject and determining its number. The third most common type of error is error in prepositions. It was noticed that students were not sure of the semantic scope of certain prepositions, i.e. they do not know whether the preposition IN, for example, or the prepositions ON and AT should be used in a given context.

These grammatical errors committed by the students in their blog posts may be attributed to some factors such as first language interference and negative transfer from L1 to L2. These errors revealed that while the students know that these forms exist in English grammar, they still have not mastered the rules governing them. These finding implicate teachers to pay attention on these 'trouble spots' so that purposive grammar-based writing instruction may be applied, so as to assist the students in developing their writing skills with fluency and accuracy.

Table 2 summarizes the common grammatical errors committed by the students in their first blog post:

Definition and grammatical error classification	Identification of errors	Correct sentences
1. Verb Tenses – misuse of verb tenses	<ol style="list-style-type: none"> 1. But as I grow old, it all get cleared. 2. We explain it and our adviser is so angry. 	<ol style="list-style-type: none"> 1. But as I grew old, it all got clear. 2. We explained it and our adviser got so angry.
2. Subject-Verb Agreement – misuse of subject/verb agreement	<ol style="list-style-type: none"> 1. My parents wants me to be like her. 2. I still doesn't have hair yet. 	<ol style="list-style-type: none"> 1. My parents want me to be like her. 2. I still don't have hair yet.
3. Prepositions – when a preposition is misused, omitted, or added	<ol style="list-style-type: none"> 1. We live at Las Piñas City. 2. There are no perfect people in the Earth. 	<ol style="list-style-type: none"> 1. We live in Las Piñas City. 2. There are no perfect people on earth.
4. Morphology – omission of plural "s"; misuse and addition of	<ol style="list-style-type: none"> 1. In just a few minute you'll have nothing. 	<ol style="list-style-type: none"> 1. In just a few minutes you'll have nothing.

the plural ending in “s”; wrong word formation	2. I like listening to musics.	2. I like listening to music.
5. Articles – omission or addition of “a”, “an”, or “the”	1. I came back to () Philippines. 2. My life is a simple.	1. I came back to the Philippines. 2. My life is simple.
6. Verbs – omission of the verb “do” or “be”; confusion for verb choice	1. He () not showed that I’m incomplete. 2. I () proud to myself.	1. He did not show me that I was incomplete. 2. I am proud of myself.
7. Pronouns – misuse of pronouns	1. I think his a businessman. 2. Me and my sister used to watch movies together.	1. I think he is (or he’s) a businessman. 2. My sister and I used to watch movies together.

Table 2. Common grammatical errors committed by the students in their blog posts

Learner-perceived Advantages of the Blog Project

Students’ interview results and reflections revealed that all of them “enjoyed” the blog project overall. When asked about the benefits of the project, reasons why they enjoyed blogging, and what they learned from the project, students reported a variety of responses. Thirty-two learners agreed that they enjoyed having the freedom to express their feelings and opinions on different topics, and that it gave them “voice” and served as their “emotional and intellectual outlet”. Fourteen learners cited that they thought their writing skills had improved from doing the project. Eleven learners believed that the project helped them socialize and interact with their classmates in a virtual environment outside the classroom. Below are some of the students’ reflections.

Table 3 lists all responses regarding the advantages of the blog project.

Response	Frequency	Percentage
Freedom and confidence to express and share one’s feelings, ideas, and opinions on certain topics and issues	32	31.1
Improved writing skills	14	13.6
Interacting and socializing with other learners online	11	10.7
Increased societal awareness	8	7.8
Understanding oneself and others	7	6.8
Learning and using new vocabulary	6	5.8
Grammar practice	6	5.8
Practice in technology	4	3.9
Thinking critically	4	3.9
Served as past-time/ hobby	3	2.9
Learning new ideas	2	1.9
Improved time management	2	1.9

Typing practice	1	0.97
Developed creativity	1	0.97
Improved reading skills	1	0.97
Exciting, interesting, and fun activity	1	0.97
Total	103	100

Table 3. Learner-perceived advantages of blogging

The following students' avowals support these findings:

Perceived benefits of blogging	Interview transcripts and reflections reflecting students' perceptions on the benefits of blogging
Freedom and confidence to express and share one's feelings, ideas, and opinions on certain topics and issues	<p><i>While writing in a blog, we can learn to express our ideas and own opinions on topics of common interest to other people.</i></p> <p><i>This blog project develops my self-confidence in posting personal opinions and experiences.</i></p> <p><i>For me, blogging helps me to express my ideas through the cyber world. I am free to share with others what I really feel about something or someone I want to talk about.</i></p> <p><i>It taught me how to express more of what I'm having in my mind. It also gave me confidence to share my knowledge and especially my opinions.</i></p> <p><i>Through blogging, I could say that I was able to express the pain of growing up without a father.</i></p>
Improved writing skills	<p><i>I believe my written communication skill improved while I expressed myself in this blog project because I learned how to write in different styles to make my blogs interesting for my classmates.</i></p> <p><i>It enhanced my writing skills as I was able to use it as a diary.</i></p> <p><i>Having a blog taught me to make an essay in an organized manner.</i></p> <p><i>I learned to compose creative ideas through my blogs.</i></p> <p><i>It forced me to write... at first I thought it was very boring, but as I continued to blog, I learned how to love writing. It's interesting and helpful naman pala.</i></p> <p><i>Through this blog project, I gained new friends.</i></p>
Interacting and socializing with other learners online	<p><i>It helped us to interact with our classmates by reading and leaving comments on each other's blogs.</i></p>
Increased societal awareness	<p><i>It helped me widen and deepen my thoughts about the things around me.</i></p> <p><i>I also got to know the issues here in the Philippines & around the world.</i></p> <p><i>By researching for my own topics and reading my classmates' blogs, I learned more about the different situations in our society.</i></p>
Understanding oneself and others	<p><i>This project let us see the world in a broader way.</i></p> <p><i>This project made me know others well. It helped me reach out to people for them to understand me for who I</i></p>

	<p><i>am.</i></p> <p><i>In just a click, people around me could have piece of me and of course I did that that in the same way to their blog posts in order for me to know their part.</i></p> <p><i>Because of this project, we know now our block mates' background.</i></p>
Learning and using new vocabulary	<p><i>Because of this blog, I learned to research and check the spelling of words first before I published them. I also encountered new words that I didn't know.</i></p> <p><i>While reading some of my peers' posts throughout, I noticed that they were able to use different and more complex vocabulary.</i></p> <p><i>I have been more creative in picking the best words for my blogs.</i></p>
Grammar practice	<p><i>I was very careful with my grammar and vocabulary, and even spelling. Before posting my blog, I made it sure that I didn't have errors, because my classmates may laugh at me haha.</i></p> <p><i>Honestly, I think my grammar improved because (classmate's name) constantly checked my sentences. I thank her for that.</i></p> <p><i>This project also helped me detect the errors in grammar of classmates as well as correct them and vice versa.</i></p> <p><i>This blog project enhanced my English grammar on how to create and combine perfect sentences and ideas using the English language. I was able to write long sentences.</i></p>
Practice in technology	<p><i>This blog project helped us to maximize our gadgets and technologies in a better way.</i></p> <p><i>I was able to use this technology in a useful and sensible way.</i></p>
Thinking critically	<p><i>Our reasoning and judgment was practiced in commenting on the societal and global issues.</i></p>

Table 4. Students' avowals on the advantages of blogging

From these responses, it can be deduced that students view blogging as a viable tool to express their ideas, improve their writing skills, and practice their grammar and vocabulary skills. This finding corroborates with the results of similar studies (Ware, 2008; Zhang, 2009; Lee, 2010 as cited in Cequena, 2013), emphasizing the point that students have positive attitude towards blogging, which they view can develop their English skills in vocabulary building, grammar, and writing.

Furthermore, these findings echo the results of related studies (Roth, 2007; Kelley, 2008; Anderson, 2010 as cited in Cequena, 2013) which show that frequent blogging among students develop writing skills, enabling them to take pride in their achievements, and consequently developing their self-esteem.

Conclusion

This study explored the viability of integrating technology into an ESL classroom by using weblogs. The findings suggest that writing online via blogging may facilitate students to develop their English writing skills, express their ideas and opinions freely on certain topics and issues, and improve their grammar and vocabulary. With its interactive and communicative nature, blogging also increases students' motivation, self-confidence, and "sense of ownership" (Campbell, 2004). Furthermore, blogging promotes free exchange of ideas and critical thinking skills among students through online peer feedback, which consequently can "empower students to become analytical and critical" (Oravec, 2002, p. 618). Despite its minimal disadvantages such as accessibility, connectivity, and time constraints, language teachers can devise appropriate project mechanics to integrate blogging effectively into the language classroom. Any attempt to employ this technology must consider the educational goals of the institution, the readiness of the learners, the enthusiasm of the teacher to redefine his or her teaching approaches, as well as the competencies that the school aims to develop among its students.

Students' responses suggest that blogs provide a rich, authentic, and "collaborative learning environment" (Dieu, 2004; Mitchell, 2003) for both learners and teachers who seek to find innovative ways in learning and teaching the English language. This study implicates educators to consider blogging as a "useful supplemental aid to teaching" (Johnson, 2004). However, proper planning and course design should be considered to effectively maximize the potentialities of this computer-based resource.

Aside from exploring the potentialities of blogging for classroom integration, this study also identified and categorized the common grammatical errors that students committed in their blog posts. The results show that students encounter problems with basic grammatical rules in English such as verb tenses, subject-verb agreement, prepositions, morphology, verbs, articles, and pronouns. These results shed light on the process through which ESL learners internalize the grammatical rules of English as a target. It further shows that error analysis can help teachers pinpoint systematically the common grammatical problems that students make as they perform certain English writing tasks. Consequently, this study provides an insight into language learning problems encountered by students, which is useful to teachers because it tells about common trouble spots in language learning particularly in the acquisition of writing skills. Language teachers, syllable designers, textbook writers, and curriculum developers may also consider the findings in this study in planning, designing, and implementing lessons and instructional materials.

This classroom-based study hopes to inspire educators to incorporate blogging in their own pedagogy to provide students modern and innovative learning facets. Other forms of blogging such as inter-class, inter-school, and inter-cultural blogging may be tried out to explore its effectiveness with varied audiences and contexts. In addition, other approaches to research such as experimental and mixed methods may be done to investigate closely the usefulness and effectiveness of blogging in the teaching of writing skills and other English language skills.

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Contact e-mail: romualdo.mabuan@lpu.edu.ph

Authenticity in Project Based Learning: Building Community

Michael Stockwell, Sugiyama Jogakuen University, Japan

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Abstract

Implementing project-based learning (PBL) in an English as a foreign language EFL context can be problematic. A possible solution is to increase attention to authenticity in project design. In this paper I argue that there are four features of authenticity for PBL in an EFL context. The first feature, authentic input, is widely discussed in the literature and is the focus of much of what is considered authentic. This paper argues that there are three other important features of authenticity regarding the implementation of PBL. They are authentic task, authentic output, and authentic audience. The authenticity of these the features may improve the benefit of PBL for learners and instructors.

Keywords: Project based learning, authenticity

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PBL (Project Based Learning) is widely viewed as a valuable pedagogical approach that gives learners the freedom to explore and learn about topics that interest them. Combine this with the opportunity for simultaneously learning life-based skills while stretching out their language abilities, and it appears we have a perfect match.

Teachers who have used PBL report a wide range of benefits with the most common being authenticity of experience that the language learners were exposed to during the project cycle (Stoller, 2006). PBL affords flexibility for teachers in curriculum design and allows teachers to target material that motivates students (Tomei, Glick, & Holst, 1999) PBL allows the learner to be at the center of the process and promotes autonomy, problem-solving, critical thinking, as well as interpersonal and life skills.

However, there are a number of challenges in implementing PBL for foreign language study in particular in contexts where learners are homogenous in their first language and have limited opportunities and time to focus on language studies. This paper discusses four elements of authenticity: input, task, output and audience. I further argue that when designing a project, wider application of authenticity across these four elements might help overcome some of the problems associated with applying PBL in an EFL context.

PBL for language learning is defined in this paper as a pedagogical approach to learning that strives to integrate content with language learning to encourage both collaboration and autonomy while exposing learners to practical, real-life skills. “Students drive their own learning through inquiry, as well as work collaboratively to research and create projects that reflect their knowledge” (Bell, 2010, p. 39). With this approach, learners have both a voice and choice in the process and product aspect of PBL.

Beckett (2002) proposes that problems with PBL in foreign language study can be overcome by explicitly teaching learners the value of this language learning approach. However, this paper argues that in EFL contexts this is still less than optimal. There is a need to prove to learners that time spent away from direct language study is also valuable in its own right. Wentzel and Brophy (2014) write about the instrumental value of learning activities that have life application potential either for the learners’ current situation or what will be useful in the future. They posit mastery of these skills can be powerful incentives for motivating learners. The outcome PBL projects possibly can be improved by designing authenticity throughout the project cycle. To do this, I propose that authenticity features of PBL also need to be maximized and explicitly communicated within the framework of PBL project design.

Literature Review

As a teacher in an EFL context in Japan, I have two main issues regarding PBL. First, when PBL is applied to the study of a foreign language, it is often in the English as a Second Language (ESL) and not EFL context. With projects, if learners are all of the same first language (L1) I have observed a tendency to drift into L1 use during the part of the process that is most beneficial for language study. The product comes before the process, and L1 predominates in the group work.

Secondly, the majority of research on PBL focuses on mainstream education where the medium of communication is in the learners’ first language. PBL in contexts such

as science, engineering, and commerce have proven to be very successful (Beckett, 2002). However, while there is widespread use of PBL in foreign language learning, the effectiveness of this approach has yet to be satisfactorily proven (Beckett, 2002). Numerous anecdotal comments from project teachers and students indicate that there are problems and issues with the use and effectiveness of PBL. A major problem is learners' perceptions of the value of PBL (Beckett & Slater, 2005, p. 108). Eyring (1989) found that students were dissatisfied with the project approach, as they did not seem to think the tasks were worthwhile pursuits in ESL classes. In Beckett's (1999) study of high school ESL students, less than one-fifth of the 73 participants enjoyed project work or valued the project approach. Furthermore, participants were in an ESL context. According to Moulton and Holmes (2000), many students dropped out of project-based classes since they believed that ESL classes should be limited to the study of language, and they resented being asked to accomplish non-linguistic tasks. Similar findings were reported by Guo (2006), where students in China also wanted teachers to "teach for the test" (p. 150).

From my own classroom, I was told by students that they preferred to focus directly on four skills and vocabulary acquisition. It seems to students that the focus on content and skills were getting in the way of their language studies. Their objective is to obtain a high TOEIC test score and not develop computer skills or other life skills. These goals seemed to be worthy, but not as important as a TOEIC score. This unfamiliarity with PBL makes it difficult for learners to be able to set appropriate learning goals required for successful completion of a project. An equally important consideration is to encourage learners to use the target language in the process of completing the project. Fragoulis and Tsiplakides (2009), also reported on problems with Greek EFL students not using the target language for communication. Students also found the projects to be too long and lost interest and motivation before it was completed. Kemaloglu (2010) also described the difficulties of getting students to use English both inside and outside of class to complete their projects. She also reported that her students predominantly used resources found in their first language and not the target language. It is all too often that learners will use their first language to complete the project tasks.

The problem regarding motivation appears to be twofold. First learners place a higher priority on direct language study of the four skills and vocabulary acquisition than experiential learning. Project work tasks seem to be more of an annoyance than a route to mastery of a foreign language. Secondly, and closely related, learners may become demotivated when the content material of the project is viewed as inauthentic or unrelated to themselves.

According to Beckett and Slater (2005) a methodological tool called "The Project Framework" helps socialize learners to the usefulness of PBL and language learning in general. The idea being that explicit knowledge of the goals associated with project work in ESL classes will increase motivation. However, while this is helpful in improving the perceived value of PBL in an EFL context, it is still insufficient.

Learners will likely focus their attention on projects that they value as useful to their current or future lives. Often curriculum is too abstract or focused on an issue or topic that the learner will likely never have to attend with. Features that are authentic have the potential to be meaningful for learners in their own right. What constitutes

meaningful life skills is not easy to determine. However authentic instrumental value learning activities can motivate students by helping them appreciate the knowledge or skills focused on in a project because it will help them currently, provide them with the means to social advancement, or prepare for future occupational or achievement later in life. Student motivation, Wentzel and Brophy (2014) argue, should be at the center of curriculum design.

The need for authenticity in language teaching is not universally accepted. Some, like Taylor (1994) have the view that classrooms by their very nature are authentic. This is a valid point, and with competent instructors there hopefully are numerous incidences of authentic communication. However, Taylor (1994) concludes that we should have faith in the ability of our students to use their sociolinguistic abilities, education and experiences to engineer authentic discourse within the classroom. I strongly disagree with this aspect, and especially regarding PBL in an EFL context. Taylor's point may hold true for different kinds of classroom activities. However, when we are asking our students to invest hours and weeks in a project, they need to perceive that the project is meaningful. Even if we take a weak version of the need for authenticity, it is plausible that motivation can be increased if projects are designed with the concept of authenticity in features of PBL project design.

In classes with the same first language, it is essential that authenticity move beyond providing elements of authentic inputs and contexts and considers the need for other authentic features. When applying PBL in foreign language study, we need to consider the level of authenticity at various stages of the project. If the objective is to use authenticity to increase learner motivation, we need to go beyond realia and focus on the task, output and audience for the project. The next section reviews some of the definitions that are used for authenticity. I'm a bit lost throughout this section, particularly in the early sections, where you seem to be interspersing aspects of your own experience. I think you need to take a funnel approach here—start by summarizing some of the general issues that have come up in research on PBL, then focus on the specific issues that your four features are designed to address. It seems that a related issue is motivation, so perhaps that is the overall theme under which aspects of authenticity should be discussed. Also, at this point I am giving up on marking the many grammatical and stylistic problems. This needs to be checked and addressed more carefully before you submit the next draft.

Authenticity in PBL

Stoller (2006) in her influential study, an analysis of 16 studies of different aspects of PBL, reported eight common benefits of project work. Stoller emphasizes that the most commonly cited benefit of PBL is the authenticity of experience and language. However, it does not elaborate on what authentic experience entails, and could be limited to only what is described as authentic sources of input and themes.

Gilmore (2007) details eight possible definitions of authenticity that emerges from the literature. While these definitions are not limited to PBL, they are interesting in that they demonstrate the wide differences in opinion on authenticity and how the definitions are interrelated when discussing authenticity in language learning. In addition, Gilmore (2007) and Tatsuki (2006), highlight the difficulties in trying to anchor a workable definition of authenticity. In analyzing the eight definitions,

Gilmore (2007) holds the view that “the concepts can be situated in either the text itself, in the participants, in the social or cultural situation and purposes of the communicative act, or some combination of these” (p. 98). This is consistent with a definition of authenticity for PBL, in that we have to look at authenticity as being multifaceted and apparent at various stages. Also, this relationship is interrelated between the various steps of a project based on PBL.

Both Taylor and Gilmore refer to Morrow (1977) for their definition of authenticity. “An authentic text is a stretch of real language, produced and designed to convey a real message of some sort” (p. 14). This is a good place to start, but falls short when attempting to define authenticity in regard to PBL. To define authenticity in PBL, there is a need to recognize the various aspects of authenticity that spans beyond initial input and moves to what Taylor (1994) proposes “not only a function of language but also of the participants, the use to which language is put, the setting, the nature of the interaction, and the interpretation the participants bring both the setting and the activity” (p. 8).

To fully explain authenticity in PBL, I identify four features of authenticity: input, task, output and audience. The following section will discuss the potential role authenticity has to play in PBL in an EFL context. To contrast the differences in authenticity, I will compare two projects. One is a typical project for an EFL class with the theme planning a trip to Australia. The second is designing a website for visitors attending a conference at the learners’ own university.

Authentic Input

What is regarded as authentic is often limited to the selection of project themes or real-world items that form authentic input. The selected themes, which are often generated by the language instructor, thus act to frame the context of the project. Within PBL literature, a considerable amount has been written about authentic tasks that address real-world problems such as finding an apartment, deciding a study-abroad program, creating an advertisement to support a cause or other tasks that may be of interest to learners.

This focus of context with real-world themes or issues provides the authenticity that teachers strive for, and learners often appreciate. The problem with limiting authenticity to the initial stage of the project cycle is it essentially only provides the background content that learners need to process to complete the project. As Stoller (2006) writes, the vast majority of project work exposes learners to the target language through the use of authentic information sources. However, it is questionable whether this is sufficient to motivate learners to communicate in the target language throughout the project-cycle.

Teachers are well versed in the benefits of using realia in the classroom. Many teaching material and even test use authentic or authentic-like materials. Unfortunately, if one looks at the projects that are recommended in PBL books for foreign language learning, you will find that authenticity often stops at this point. Examples of authentic input commonly employed are films, commercials, text from print media, audio recording and many other types.

In regard to input for our Australian Trip project, we could have learners visit websites or travel agents and gather the necessary information. With the advent of Skype and free telecommunication learners could actually call hotels and ask for availability and prices for a variety of rooms. All would have a high degree of authenticity. With the conference website, students would visit the conferences previous website or interview conference organizers or previous attendees. They'll likely also need to converse with the teacher on what kind of requirements would be necessary. Once again, there is a high degree of authenticity.

Authentic Task

Tatsuki (2006) brings up a very interesting point about the modern philosophical meaning of authenticity. She states that there are two types. In Type 1 Authenticity is established based on the quality of realness, Type 2 authenticity is based on the product of quality interaction. Citing MacDonald (2005, n.p.) who argues that "language teaching – and in particular English Language Teaching – has clung too long to the first of these notions of authenticity at the expense of the other". This is the point that is being made in this paper in regard to PBL. The authenticity of material is insufficient to motivate students to commit to a project program.

"The notion of authenticity has largely been restricted to the discussions about texts; there have been few systematic attempts to address the question of task authenticity" (Guariento & Morley, 2001). As discussed previously the important aspect of projects is not necessarily in the authenticity of the input, but how the input is manipulated for pedagogical purposes. The goal of the project teacher is to find a proper "fitness to the learning purpose" (Hutchinson & Waters, 1987, p. 159). Authentic tasks will have real-world relevance if it is purposeful for the learner.

Authentic tasks are defined as pedagogical activities that allow learners to demonstrate their knowledge to solve real-world problems. Authentic tasks "create a bridge between what is learned in the classroom and why this knowledge is important to the world outside of the classroom" (Kolk, n.d.). A crucial part of task authenticity is the degree of real communication that takes place in conveying a genuine message. However as Fanselow (1982) cautions it is not easy. Fanselow cites the case of a Chinese chef who had been taught to describe his work as he goes about it. "But does a Chinese chef need to be able to say, I'm cutting the onions" (p. 180)? Other more practical uses might be to be able to book a reservation. Breen (1985) argues that the most authentic tasks are able to exploit the learning situation.

In the Australian Trip project, numerous authentic tasks could be negotiated. For example: determining the most economical airfare, hotels, meals package, and car rental. Also, a plan for sight-seeing could be tasked. In the case of the conference website, learners could be tasked to research and interview conference organizers, draw up sketches of the website and develop content for the site and learn the necessary computer skills. All of these tasks would have a high degree of authenticity.

Authentic Output

For authentic output to be a feature of a project, the form, style and standards that are associated with a context need to be adhered to. Returning to the Australia trip

project, an itinerary with all relevant times, flight numbers, arrival and departure information and other details would need to be clearly stated following standard style of the industry. An oral report, or a poster presentation would lack authenticity. Authentic output is dictated by the task set in the project design. With the conference website, the learners would need to follow proper formatting for websites. Clear, uncluttered format with relevant information clearly tagged and accessible. There would also be the need to follow proper file and image standards that learners would likely have to research.

Related to my commented about examples of authentic output, I'm noticing a lack of positive examples throughout the whole paper. That is, you tell us what is wrong with PBL, what the limitations are, why particular practices, tasks, etc. are inauthentic, but you do not always give us an example of something that actually would be authentic (or at least more authentic).

Authentic Audience

Allan and Stoller (2005) detailed key factors for successful project work which were: the need to focus on real-world issues, student collaboration, focus on form, focus on process as well as product, and an emphasis on integrated skills and end-of-project-reflection. In this and the majority of other studies, there is no direct discussion on the benefits of authentic audience. In most cases, it appears that projects are designed with the final product to be presented to an instructor or to a simulated audience. Learners are required to do enough to satisfy the requirements of the teacher. With authentic audience, students are tasked with creating a product that could be used in a real-world context. It is argued that this can be motivating for students, as they need to think outside of the confines of the classroom. That is not to say that the classroom is irrelevant. The negotiating of the project requirements between the learner and instructor is very much authentic as is, hopefully, the group work that occurs in the process stage of the project.

If the final product is going to be used by an authentic audience, students might be more likely to use a second language in carrying out the tasks in homogenous classrooms. When learners submit work to their instructor, they likely believe that the instructor will be able to fill in the gaps in language and content. When they submit project work to peers, they are likely to believe their peers will forgive them for gaps in their knowledge of content or the target language. Learners are possibly motivated to work harder when their work has a sense of permanence and an authentic audience. Also, ideally learners will be able to receive authentic feedback from the audience, which also will, hopefully, be motivating. In the case of the conference website project, the organizers had a great deal of contact with the learners over the duration of the semester and were able to provide feedback on their website. With the Australian Trip and similar kinds of projects, the audience is not authentic. The project settles on the instructor's desk, and the project will likely never be authentically used.

While the objective is to design projects that maximize authenticity, clearly due to pedagogical constraints it will not always be satisfied. However, in the EFL context, whenever possible, effort should be made to include some of the criteria listed below

during the initial designing stages. The following are an adapted list from (Stockwell, 2015). In the bracket of each line is the authentic feature that the item supports.

1. The target audience for the final product is apposite for the learners. Learners will judge if the audience is in a position to benefit from the content of the project. (Audience)
2. The target language will be the natural mode of communication between the audience and the learners. (Output)
3. Learners will have access to relevant information and knowledge that the audience will value. (Input)
4. The product will have a sense of permanence and completeness. (Output)
5. The product for the audience will have significant content that will be useful for the learner as well as the audience. (Task) (Audience)
6. Learners will have input on the direction and outcome of the project. (All)
7. The audience for the project will likely provide feedback in the target language. (Audience) (Input)

Perception of Learners

Regardless of the efforts by the teacher, if the learners do not perceive the various elements as authentic then there will be no benefit or change in motivation. Lee (1995, p. 323) warns “learner authenticity is only possible if learners feel positive about the materials and react to them as was pedagogically intended.” Lee continues that learners will not automatically be engaged with materials just because they are “authentic” – the materials need to have communicative potential and be relevant to learners’ experiences now or in the future.

Conclusion

In conclusion, there are a number of obstacles in implementing PBL in an EFL context. However, there are numerous benefits and with proper foresight by instructors in the planning stage, learners may be motivated to exert the needed effort to benefit from this type of experiential learning. This paper argues that when appropriate authenticity should be designed in PBL at input, task, output, and audience stages of the project cycle.

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*Integrating Global Education into the University English Curriculum through
Technology-Enhanced News Circles*

Wan-lun Lee, Fu Jen Catholic University, Taiwan

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Abstract

Living in an increasingly globalized world, human beings have to solve more and more problems and face many new challenges together. It has thus become essential for English teachers in the 21st century to develop new and effective ways to integrate burning global issues and events in ELT. This paper reports on the approaches and outcomes of a technology-enhanced news circle project designed to incorporate global education into my University English course for Taiwanese university students not majoring in English. Twenty-five Taiwanese participants of this project were divided into six mixed-ability news discussion groups, or circles, based on the results of a TOEIC-style reading test. Thirty news articles about various current global issues or events collected from free news websites were posted on the news circle blog created for this project, and each group, or circle, had to conduct four online role-based discussions on four different pieces of news posted on the blog. Questionnaire surveys, one-on-one semi-structured interviews, and group discussion records were employed to investigate the outcomes of this project, and the major findings show that this project was beneficial to raise these students' global awareness, increase their interest in looking for solutions to world problems, improve their critical thinking skills, motivate them to read and discuss in English on the Internet. The design and implementation of this project and the findings of this empirical research will provide valuable insights for those interested in integrating global education and ELT in EFL countries.

Keywords: global education, university English, news

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Introduction

Living in an increasingly globalized world, human beings as world citizens have to face and deal with more and more problems and challenges together, and the teaching of global issues, or global education, has thus become a crucial part of more and more school curricula worldwide. Within the field of English education, over the past few decades, there has been a growing interest in bringing real world content into the classroom as well as a strong call for making global issues “a central core of ELT” (Maley, 1992, p.73). For example, H. D. Brown claims in his plenary talk at the 24th Annual Conference of TESOL (1990) that English language teachers have “a mission of helping everyone in this world communicate with each other to prevent the global disaster ahead.” In a similar vein, Cates (1997) also stresses that the new commitment of ELT is to promote “international understanding” and “global awareness,” and that any English teaching can’t be called successful if the students, however fluent, do not care about the world and its problems. In his 2009 article, Cates argues that “language has a certain degree of flexibility of topic that other subjects do not,” so he urges all language teachers in the 21st century to deal with global issues in the language classroom in order to enable their students to effectively acquire the target language as well as “the knowledge, skills, and commitment required by world citizens to solve global problems,” such as “terrorism, ethnic conflict, social inequality, and environmental destruction” (p.41).

Through the efforts of the advocates of global education and scholars and educators in the field of ELT, many EFL instructors around the world have tried to integrate burning global issues and real world problems into their teaching in various ways in order to enhance students’ global awareness and linguistic competence at the same time. For example, Joritz-Nakagawa integrated global education and cooperative learning in an EFL reading class at a Japanese university and found that the use of global issues was “stimulating and challenging” for the students but these issues provided a rich context for them to learn to “communicate clearly despite difficulties with English” (2006, p.150). Focho (2010) developed an integrated approach to integrating the global curriculum in language lessons and made it possible for learners in their fifth year of secondary education to improve the four language skills, grammar, and vocabulary through a series of classroom activities closely linked to global topics. Omidvar and Sukumar (2013) brought global education into an English language conversation classroom by having a group of intermediate-level English learners aged between twelve and nineteen years old read one passage about a global issue for each class, discuss some questions related to the topic in small groups and then give a short talk about it during class; after the instruction, they found that these students showed a higher degree of understanding of global issues and became more capable of analyzing problems and thinking critically about those issues.

Although it is now widely acknowledged that it is important for teachers to develop ways to integrate global issues and world problems in ELT, global education is not particularly emphasized in many university EFL classrooms in Taiwan, and the lack of emphasis on exploring all subjects from a global perspective throughout the curriculum in secondary education, as well as Taiwanese media’s failure to report more on world news and international affairs, has led to the widespread ignorance of the world and its problems among Taiwanese university students (Huang, 2008). A number of university teachers (e.g. Prof. Chia-Tung Lee and Prof. Hung-En Liu) have

publicly expressed their concerns about Taiwanese university students' lack of interest in and knowledge of the world outside of Taiwan, and as a university English teacher myself, I have also found that most of my students are either unaware of or indifferent to global issues and the only world news they might care about is those related to their favorite sports, video games, or celebrities. Since English itself is an ideal tool to get access to global knowledge, issues and problems, it is thus crucial for university EFL teachers to take the responsibility for the integration of global education in ELT in order to help draw these students' attention to current issues of global significance and prepare them to be more active and responsible global citizens in this interrelated and interdependent world.

The Technology-Enhanced News Circle Project

This paper reports on the approaches and outcomes of a cross-cultural technology-enhanced news circle project inspired by my experience of using technology-enhanced literature circles with Taiwanese and Japanese undergraduate students, and designed to incorporate global education into English language courses for Taiwanese and Japanese non-English majors. The literature circle, first introduced by Daniels Harvey in his book *Literature Circles: Voice and Choice in Book Clubs and Reading Groups*, is a small peer-led discussion group whose members read the same literary text and gather together regularly to discuss it with "discussion roles" (e.g., discussion director, connector, summarizer, and travel tracer) before they choose a new text and "move to a new cycle" (1994, p.13). With the help of computer and online technologies, I developed a cross-cultural technology-enhanced literature circle project to promote literature-focused communication and collaboration between Japanese and Taiwanese EFL university students, and a lot of positive feedback from the participants encouraged me to take this approach into consideration when I looked for appropriate ways of introducing global issues to my students. After I read Gregory G. Anderson's 1996 article about the importance of using alternative supplementary materials such as newspapers and magazines to teach global issues instead of relying solely on a good textbook, I decided to use newspaper articles about global issues as the reading material and change the name "literature circles" into "news circles" to highlight the difference in the reading and discussion topics between them.

The six discussion roles designed for news circles are Discussion Director, Summarizer & Recorder, Background Researcher, News Tracker, Connector, and Word Wizard, all of which are rotated among members in the same news circle and are assigned different tasks to carry out so as to ensure equal participation and contributions in the discussion process and enable students to understand the world issues reported in the news from different perspectives. For example, the Discussion Director has to develop a list of open-ended questions about the news article to promote thoughtful discussion on the global issues presented in the news among group members and to make sure each member makes equal contributions during the discussion. The Background Researcher needs to search on the Internet for articles, images, sound files, or videos related to the background or cause of the major global event(s) or issue(s) presented in the news article, study the information provided by these materials, and share the findings with the others during the group discussion. The Connector's task is to find the connections between the global issue or event in the news and his or her own life experiences, similar events at other times and places, a book, a story, an article, a movie, a song, or a television program on the same topic.

The News Tracker tracks the news story or event by finding out what happened next and by studying how the same event or issue was reported or presented in the other news websites before sharing the findings with the others during the group discussion.

In order to add the element of intercultural communication to news circles that focus on the reading and discussion of global issues, I decided to take advantage of the power of technology in this news circle project and started to look for a group of foreign university students to work with Taiwanese students on the project. Thanks to the help of my Japanese acquaintance, I had the privilege to know Asami Nakayama, a Japanese university English teacher that was concerned about Japanese youth's lack of interest in global issues, and she managed to find eleven Japanese volunteers in her TOEIC class at Nagoya Gakuin University. These Japanese Economics-major students and twenty-five Taiwanese students from Fu Jen Catholic University not majoring in English participated in this project and were divided into six mixed-ability news discussion groups, or news circles, based on the results of a TOEIC-style reading test. Each group of six (either four Taiwanese and two Japanese or five Taiwanese and one Japanese) had to use Skype or LINE to conduct four role-based synchronous online discussions on four out of thirty online newspaper articles of different lengths and levels of linguistic difficulties and about a variety of current global issues, concerns or events (e.g. terrorist activities, virus disease outbreak, social justice, gender inequality, democracy, racial discrimination, and environmental protection and destruction), collected from news websites such as *CNN*, *BBC*, and *Taipei Times*, and posted on a blog created for this project.

Researching into the Effects of the Project

All the six groups completed the four cycles of news circles successfully though not all the participants joined the discussion every time, and a mixed-method study was conducted to investigate into the practice and effects of this project through both quantitative and qualitative data collected from questionnaire surveys, one-on-one semi-structured interviews, and group discussion records. The major findings of this study are as follows:

1. Drawing students' attention to world news and global issues

The results of the "getting started" questionnaire survey show that 5% of the respondents strongly agreed and 35% agreed that they seldom read world news about things that happened or are happening outside their country although 54% of them strongly agreed and 41% agreed that as global citizens, they should spend more time reading news about current global events, issues or problems. The exit questionnaire survey results, however, show that all of the participants believed that to some extent, reading and discussing the news articles had made them care more about world events and global issues. The interview data are also in accordance with the questionnaire results. For example, most of the interviewees said that they would like to follow the latest development of the world event or global issue reported in the news articles they had read and discussed with their group members, and some of them mentioned that this news circle project had made them start to think more about some world problems and their possible solutions.

2. Enhancing students' critical thinking skills

As Metzger argues, teachers have to help students become “intelligent and critical media consumers” (1988, p.15). The news circle project was designed and implemented in a way that could encourage students to read the news articles more carefully, seek out alternative sources of facts or all sides to a certain global issue, and pay closer attention to how different people react differently to the same issue. After a careful examination of the discussion records, I found a lot of evidence showing that students learned to think critically of what they read from the news. For example, when discussing the news about Obama's response to the Ebola outbreak, a group of students questioned why the American President would feel that the world was expecting America to combat the spread of the virus alone as reported in the article. Many interviewees also mentioned that this project had given them the chance to do more thinking about the global issues and how they were presented in the news articles instead of simply reading the news and take in the information without any doubts.

3. Motivating students to read world news and discuss global issues in English

The chance of working with foreign group members gave many students strong motivation to take part in this news circle project. According to the results of the “getting started” questionnaire survey, 56% of the respondents seldom discussed current world events or issues reported in the news with other people, but 19% of them strongly agreed and 57% agreed that they would like to know whether they and foreigners share the same view on these events or issues. In the exit questionnaire survey, 74% of the participants felt that working with group members from another country had given them stronger motivation to do a good job for this project and 68% of them felt disappointed when their foreign group members couldn't join the news discussion for some reason. The interview data also show that the interviewees felt motivated to read the news and discuss it with the others, especially their foreign group members, and they thought affirmatively of this way of improving their English ability.

In addition to these positive findings, there is also evidence related to the other benefits of this project in the data, such as the improvement of students' English ability, especially reading and communicative skills, and the development of students' cooperative learning skills. However, the participants also made some negative comments on the project. For example, the Taiwanese students often complained that their Japanese group members either said very little during the discussion or disappeared without giving any reason before the discussion was over. The Japanese students found it very hard to join the online discussion because they were often busy with their part-time jobs after school but their Taiwanese group members preferred to have the discussion in the evening. Besides, they felt that their English was not good enough for them to join the discussion conducted in English, and they often had trouble understanding what their Taiwanese group members said. In other words, the differences in the English proficiency level and the daily or weekly schedule sometimes made it very hard for these two groups of students to work together on the project. These problems might not be so unusual in the process of conducting a project involving cross-country collaboration and communication, but they should be taken into careful consideration in the preparations for future practice of any similar project.

Conclusion

As Brinton, Snow and Wesche (1989) argue, language is a means of learning about the world. English teachers should stop sticking their heads into their textbooks, most of which may not cover enough of burning global issues or “treat them trivially as an overlay on the linguistic syllabus,” and pretending that none of the world problems that our planet faces exist (Cates, 2009). Instead, they have to introduce students to important global problems and deepen their interest in the outside world through the use of authentic materials and thought-provoking student-led discussion activities. Although there is still room for improvement, the major advantage of this news circle approach to integrating global education into ELT is that it can be implemented in any English language curriculum or teaching programs and used with English learners physically based in different EFL/ESL countries, because it is mainly conducted out of class through internet technologies. It is hoped that the design and implementation of this technology-enhanced news circle project as well as the findings of the current study will provide valuable insights for those interested in promoting EFL students’ global awareness through effective language teaching.

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Contact email: leemary.tw@yahoo.com.tw

Using Blogs for Real World Writing: Encouraging Learner Independence

Sumonta Damronglaohapan, Rajamangala University of Technology Srivijaya, Thailand

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Abstract

This study aimed to investigate students' opinions on using blogs for writing and giving comments among classmates outside class. Results from a questionnaire show that students consider the act of giving comments on Blogs helped them to improve their critical thinking, problem solving and communication skills. Some students felt uncomfortable to give comments when others knew who they were. However, most of the participants preferred online to discussion to face, could express ideas in the online discussion. More than 90% agreed that Blogging supports collaborative learning both in knowledge development and group sharing. Many students agreed that Free-writing was too difficult while nearly all the students indicated Blog could help them learn how to write, they learned and used new vocabulary and they improved their writing skills. Although half of the students agreed that the assignments in Blogs were too time consuming, they encouraged learner independence.

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Introduction

According to students' quietness and embarrassing to show their opinions in class, another way to help them to express their opinions on what they learn and let them be independent learners is to encourage them to learn by blogs outside class. A reading class not only explains the strategies but also allows the students to criticise what they read. The establishment of the Internet in the last century created new and challenging environments for learning, teaching and assessment. A number of studies explore the uses of new technologies such as web pages and discussion groups (Schellens & Valcke, 2006), emails, synchronous chat, blogs and wikis (Augar, Raitman, & Zhou, 2004) in various educational settings and across disciplines. Although the technologies are new, it is important to explore new and effective ways of using them to enhance the processes of teaching and learning.

Blogs can provide an environment for students to communicate with their peers. In addition, the built-in feedback mechanism allows others to read blog articles and listen to songs and to provide some commentary (Chan & Ridgway, 2006). Blogs encourage learners to learn freely, and allow them to express their opinions from what they learn in blogs. Here, blogs were used to support communication among students in order to support reflection on their learning during a five week assignment.

The study was designed to explore the potential of blogs to support reflection and communication in realistic circumstances, and to explore the weaknesses of current practice in order to build more effective practice in the future.

Purpose of the Study

To investigate the usefulness of using blogs to encourage learner independence.

Context of the Study

The participants consisted of 28 undergraduate students majoring in English for International Communication who studied the Advanced Reading course.

Literature Review

Learner Independence

Benson & Voller (1997, p. 4) state that during the last century, the concepts of autonomy and independence have strongly affected the fields of philosophy, psychology, politics and education. Freirian ideals on the concept of empowering learners has changed and been applied way beyond its original political concept. Foreign language instructors don't see their students as being oppressed but they are now more interested in the methods of learning instead of the ways of teaching (Freire, 1970). This confirms Freire's wish to move away from teaching methods and concentrate more on creativity, inquiry, and critical thinking through by having dialogue and interaction. Learner autonomy can clearly be seen in adult learning methods of instructors with the frequent use of learner-centredness, communicative language teaching, and strategy instruction.

While talking about learner independence the terms *learner autonomy* and *learner independence* are mentioned and sometimes they are interchangeable, but this could lead to misunderstandings. *Autonomy* can mean control while *independence* means self-sufficient. Sheerin (1997, p. 56), defines independent learning as having strategy development. And he goes on to say that strategy development or learning how to learn is the pillar independent learning, which instructors relate to due to its philosophical and psychological nature. Since this paper is concerned with assisting learners to develop their language skills outside of the classroom (learning how to learn), the term *independent learning* is used since its definition incorporates both the ideas of autonomy as well as strategy instruction.

Foreign language learning are encouraging learners to use technology as it gives them the choice to choose learning material they like, plus they can work as fast or slowly as they like and follow a pedagogical path suitable for them (Blin, 1999, p. 136). With technology, specifically computers with Internet access and CALL programming both learners and instructors have the opportunity to practice their language skills in an international setting. Ngeow (1999, p. 303) states that with CALL in the classroom, instructors are helped in many ways, with learning styles and strategy development. Ngeow adds that CALL helps learners with ideas on how to present language and take part in real language learning activities. Educators are now seeing that for reflective and collaborative learning computers provide a variable learning environments. Blogs can provide this type of environment. They give learners the opportunity to interact, think reflectively and experience deep learning. Blogs improve the classroom environment and encourage students to apply their knowledge and interpretation (Cashion and Palmieri, 2002, p.157).

These are the characteristics that independent or autonomous learners possess. In an online environment where teachers or parents are inaccessible learners with these traits will succeed.

Blogs

Easy to make and maintain, blogs are almost as old as the Internet. Blogs really took off in 1999 when *Bloggerr.com* was established. They are used mostly for personal use, like a travel journal. The user does not need any technical skills to create a blog and they are easily updated.

Little (1999) states that learning a language using a computer has mostly been students interacting with an information system. With the advent of blogs that interaction has changed to interaction with other learners and the computer is just the medium of communication. Blogs get people to interact with each other in contrast to CALL where the interaction is with the application. Blogs and CALL are not a substitute for face-to-face communication but they give students a chance to think, reflect and create language at their own pace. Blogs are popular outside language learning circles so the introduction of blogs into foreign language learning students should not be a problem as they already are familiar with the concept.

Not much research has been conducted on blog use for foreign language learning. Ward in 2004 introduced a blog in his reading and writing class at the American University of Sharjah. He found that most students benefited from the blog and

helped with language acquisition and saw a rise in interest in reading and writing skills development.

Reflection for Learning

Reflection is a part of learning gain by the learners own experiences (Wu & Looi, 2012)

Denton (2011) says reflection is a humans' ability of high-order thinking and to connect their thoughts. In order to motivate learners to think or reflect on their learning researchers have broken down 'reflection' into several categories - content-based reflection, meta-cognitive reflection, self-authorship reflection, and intensive reflection (Grossman, 2009). For this study content-based reflection was thought to be appropriate as personal experiences, thoughts and feelings on blogs.

Research Methodology

Subjects

The population consisted of 28 undergraduate students majoring in English for International Communication who studied the Advanced Reading course.

Instruments

The research instruments were:

3.2.1. Five tasks including article, song, news, poem, short story on University Blog

Week 1

Task 1 Article: Eat Your Way to Health and Longevity
(<http://www.foodasfood.com/eat-your-way-to-health-and-longevity/>)

Week 2

Task 2 Song: Because You Loved Me with lyrics - Celine Dion
(<http://www.youtube.com/watch?v=Nq8TasNsgKw>)

Week 3 Task 3 News: Apple sells 9 million of its new iPhone models
(<http://www.bbc.co.uk/news/business-24201526>)

Week 4 Task 4 Poem: Will You Tie My Shoes When I Grow Old
(<http://www.poetrysoup.com/poems/best/women>)

Week 5

Task 5 Short Story: English is Confusing
(<http://www.rong-chang.com/qa2/stories/story082.htm>)

3.2.2. Campus Blog (<http://km.rmutsv.ac.th/advancedreading/>)

Students are able to access the system at any time by logging in.

3.2.3. Questionnaires:

Part 1: Students' perceptions of the usefulness of using blogs to encourage learner independence and out of class learning

Part 2: Students' perceptions of advantages and disadvantages when using blogs for real world writing?

Part 3: Students' opinions on communicative practices in blogging and self-reflection

Data Collection

The data collection process for this study included four procedures as follows:

1. The first day of the Advanced Reading class, the teacher explained to the 28 students and gave them an instruction sheet on what and how to do for their assignment.

Instruction Sheet

- Choose five kinds of issues which you mostly want to discuss in the campus blog.
- Choose materials among your classmates that can help you improve your writing skills from articles, news, songs, poems and short stories.
- Make a list of five topics that interest you.
- Submit them next week to the teacher so that the teacher will upload them in the campus blog.

2. The second week, the teacher explained how to learn and practice writing skills by logging in the campus Blog for 5 weeks. They had to discuss and give their opinions on topic by topic until they completed five weeks. And told them to be sure to check for spelling errors along with grammar and punctuation mistakes.

3. The students independently accessed the campus Blog once a week for 5 weeks.

4. The modified questionnaire consisted of thirty - one 5-point Likert scale questions to access students' attitudes towards blog learning.

All the items in the questionnaires given were explained and translated into Thai. In the seventh week the students completed the part of the questionnaire with the teacher in the class.

Blogs were used as a mandatory elements of an Advanced Reading class. Twenty - eight English major students took part in the study. The blog component accounted for 15% of the students' final grade. The purpose of the blogs was for communication practice, rather than grammar practice.

The students were encouraged to practice using their English without being concerned about mistakes.

Data Analysis

Quantitative data was collected by means of the questionnaires. Descriptive results (percentages, frequency, and mean) were used in analysing the data.

Results

The main issues addressed in the study were:

1. What is the usefulness of using blogs to encourage learner independence and out of class learning?
2. What do learners perceive advantages and disadvantages when using blogs?
3. What are the students' opinions on communicative practices in blogging and self-reflection?

Data collected included the students' opinions in blogs and the questionnaire. The questionnaire contains ten 5-point Likert scale questions. Each question was analyzed by means of its mean score and percentage so that we could understand how students' blog using can encourage them to be independent learners.

Table 1 The usefulness of using blogs to encourage learner independence and out of class learning

For the following, make a tick in one column.	5 Strongly Agree %	4 Slightly Agree %	3 Neutral %	2 Slightly Disagree %	1 Strongly Disagree %	Total % (N=28)	Mean (\bar{X})
1. Blogs contribute to more interactivity among users.	14.29 (4)	60.71 (17)	25.00 (7)	0.00 (0)	0.00 (0)	100 (28)	3.89
2. Blogs can increase the level of students' participation and strengthen the sense of community.	21.43 (6)	67.86 (19)	10.71 (3)	0.00 (0)	0.00 (0)	100 (28)	4.10
3. Comments from my classmates increased my motivation to blog	17.85 (5)	67.86 (19)	10.71 (3)	3.57 (1)	0.00 (0)	100 (28)	4.00
4. I enjoy reading others' opinions	46.43 (13)	39.29 (11)	10.71 (3)	3.57 (1)	0.00 (0)	100 (28)	4.28
5. Blogging supports collaborative learning both in knowledge development and group sharing.	46.43 (13)	46.43 (13)	7.14 (2)	0.00 (0)	0.00 (0)	100 (28)	4.39
6 It improves critical thinking, problem solving and communication skills.	42.86 (12)	57.14 (16)	0.00 (0)	0.00 (0)	0.00 (0)	100 (28)	4.42
7. Blogging reach out and interact with knowledge communities.	32.14 (9)	60.71 (17)	7.14 (2)	0.00 (0)	0.00 (0)	100 (28)	4.25
8. I enjoy a chance to communicate with classmates outside of class.	35.71 (10)	46.43 (13)	17.86 (5)	0.00 (0)	0.00 (0)	100 (28)	4.17
9. Blogs have	17.86	57.14	17.86	7.14	0.00	100	3.85

increased meaningful interaction with my classmates.	(5)	(16)	(5)	(2)	(0)	(28)	
10. I can evaluate my writing ability.	7.14 (2)	32.14 (9)	50.00 (14)	10.71 (3)	0.00 (0)	100 (28)	3.35
11. I am responsible for the assignment.	32.14 (9)	32.14 (9)	35.71 (10)	0.00 (0)	0.00 (0)	100 (28)	3.96

From Table 1, 100% agreed or strongly agreed that blogging improves their critical thinking, problem solving and communication skills while only one-half of the students were neutral to they could evaluate their writing ability. 92.86% agreed that blogging supports collaborative learning both in knowledge development and group sharing.

Table 2 Learner-perceived advantages when using blogs

For the following, make a tick in one column.	5 Strongly Agree %	4 Slightly Agree %	3 Neutral %	2 Slightly Disagree %	1 Strongly Disagree %	Total %(N=28)	Mean (\bar{X})
1. I improve writing skills.	32.14 (9)	60.71 (17)	7.14 (2)	0.00 (0)	0.00 (0)	100 (28)	4.25
2. I learn and use new vocabulary.	57.14 (16)	39.29 (11)	3.57 (1)	0.00 (0)	0.00 (0)	100 (28)	4.53
3. I feel comfortable with technology.	32.14 (9)	53.57 (15)	10.71 (3)	3.57 (1)	0.00 (0)	100 (28)	4.14
4. I see blogs as a way to express myself.	46.43 (13)	42.86 (12)	10.71 (3)	0.00 (0)	0.00 (0)	100 (28)	4.35
5. Blog can help me learn how to write.	57.14 (16)	42.86 (12)	0.00 (0)	0.00 (0)	0.00 (0)	100 (28)	4.57

From Table 2, 100% of the students indicated blogs could help them learn how to write, more than 90% agreed or strongly agreed they learned and used new vocabulary and they improved their writing skills while only one participant disagreed that he or she felt comfortable with technology.

Table 3 Learner-perceived disadvantages when using blogs

For the following, make a tick in one column.	5 Strongly Agree %	4 Slightly Agree %	3 Neutral %	2 Slightly Disagree %	1 Strongly Disagree %	Total % (N=28)	Mean (\bar{X})
1. I was worried about grammar when writing.	42.86 (12)	28.57 (8)	21.43 (6)	7.14 (2)	0.00 (0)	100 (28)	4.07
2. The assignments were too time consuming.	21.43 (6)	35.71 (10)	35.71 (10)	7.14 (2)	0.00 (0)	100 (28)	3.71
3. Free-writing is too difficult .	7.14 (2)	25.00 (7)	35.71 (10)	14.29 (4)	17.86 (5)	100 (28)	2.89
4. I sometimes cannot access using blogs.	25 (7)	21.43 (6)	28.57 (8)	3.57 (1)	21.43 (6)	100 (28)	3.25
5. I feel uncomfortable to give comments when others know who I am.	35.71 (10)	17.86 (5)	35.71 (10)	3.57 (1)	7.14 (2)	100 (28)	3.71

From Table 3, approximately 32% of the students agreed or strongly agreed that free-writing was too difficult. Moreover 57.14% agreed or strongly agreed that the assignments were too time consuming. Half of the students agreed that they felt uncomfortable to give comments when others knew who they were.

Table 4 Communicative practices in blogging and self-reflection

For the following, make a tick in one column.	5 Strongly Agree %	4 Slightly Agree %	3 Neutral %	2 Slightly Disagree %	1 Strongly Disagree %	Total % (N=28)	Mean (\bar{X})
1. I enjoy using blog discussion for writing practice.	28.57 (8)	50.00 (14)	17.86 (5)	3.57 (1)	0.00 (0)	100 (28)	4.03
2. I am comfortable with reading tasks.	32.1 (9)	46.43 (13)	21.43 (6)	0.00 (0)	0.00 (0)	100 (28)	4.10
3. I am comfortable with writing tasks.	14.29 (4)	46.43 (13)	39.29 (11)	0.00 (0)	0.00 (0)	100 (28)	3.75
4. I am comfortable with listening tasks.	14.29 (4)	71.42 (20)	14.29 (4)	0.00 (0)	0.00 (0)	100 (28)	4.00
5. I prefer online to discussion to face.	42.86 (12)	42.86 (12)	10.71 (3)	0.00 (0)	3.57 (1)	100 (28)	4.21
6. I can express ideas in the online	39.29 (11)	46.43 (13)	14.29 (4)	0.00 (0)	0.00 (0)	100 (28)	4.25

discussion.							
7. I can understand the ideas.	25.00 (7)	57.14 (16)	17.86 (5)	0.00 (0)	0.00 (0)	100 (28)	4.07
8. My partner can express in the online discussion.	32.14 (9)	46.43 (13)	21.43 (6)	0.00 (0)	0.00 (0)	100 (28)	4.10
9. I feel it was to negotiate meaning in the online discussion.	25.00 (7)	57.14 (16)	14.29 (4)	3.57 (1)	0.00 (0)	100 (28)	4.03
10. It was easy for me to discuss an issue in English in the online discussion.	10.71 (3)	25.00 (7)	42.86 (12)	17.86 (5)	3.57 (1)	100 (28)	3.21

As we can see from Table 4, about 85% of the participants preferred online discussion to face to face, could express ideas in the online discussion and were comfortable with listening tasks while 21.43% of the students disagreed or slightly disagreed that it was easy for them to discuss an issue in English in the online discussion.

From practising writing freely and giving comments on each topic in blogs for five weeks. Listed some comments given by here are some comments given by some students.

Students' comments

Week 1 Article: Eat Your Way to Health and Longevity

By Pimchanok Tanwapitak

Currently, we eat everything even insect dung or something that not food. Human are stange more and more for eatting but the most will find much that Europe and America. The disease are coming near us from our eatting cauze we only eat but not care health, We know that which good or not but I don't know that why still have eatten that. We know for the protect any disease such as: eatting the vegetable will good for health, drinking the milk will prevent bone etc. When some people to be cancer or diabetes the both are popular disease it will cause food that you eat always.

By Malai Ninmanee

Taking care of yourself is a good thing, but is that how we care. Because now that we are a disease. Result of our eating. We will eat your expensive or cheap, but it's not always good to genus. Thus it is that we do themselves. Growing your own vegetables chemicals, and other coupled with exercise. How primary care itself.

By Asman Pradoo

Well, I agree with the text "we also know so little about eating" that mentioned above. I don't want to say HOW CAN WE GROW UP UNTIL NOW? but I want to say HOW CAN WE LIVE LONG FOR A CENTURY? You know it's depends on how we are eating? Be smart paying and choosing for market and shopping for food cooking. Be smart for eating; we must know what kinds of food good or bad effect to our health.

These are some methods for us to LIVE LONG FOR A CENTURY. YOU KNOW WHERE IS MOSTLY ILLNESS FROM? It's from our eating for the answer so don't forget "Health is wealth".

Week 2 Song: Because You Loved Me with lyrics - Celine Dion

By Kanokwan Dedkongkaew

When you listen: Because you loved me. For this song I have been hearing about 10 years ago. That times I don't know what does it mean. I just know this song very musical. Nowadays, I have to listen again and I've started to finding of the means of this song. Finally, I found this song is try to shows about the power of love.

Who do you think of: Everytimes when I have listens this song I thinks of my ex-boyfrind because he is my first love and only one love of me and his love is wonderful for me likes this song.

By Jenjira Mudadinan

This song is melodious song and impress. This song meaningful with my mom because mom is that woman's lucky for married life of her. Dad was always there for her. He will indulge her forever. After I listened this song I thing that she is a lucky woman for married life because her husband takes care forever. The truth of world I want to everyone have that loves. The love is beautiful for me and everyone. In the future If possible I want to be her 555. The finally important loved for me are I love family very much.

By Chumpoonit Tongjear

While i sited on the chair to this song. I ever hear just recently, But i never to found mean it. Until now i'll must searching HaHAHAHAH after i understood to mean of song I'll get to love .It convey definition " true love" I sit on the chair my house with listen this song First! i thought my mom and close friend (man) especially my mom because nobody come can to replace true love like a mom. I like her (Celine Dion) i love her inner beauty & good voice. I got feel want to smile and cry i believe that. "love" when appear what times...it's always beautifully.^-^

Week 3 News: Apple sells 9 million of its new iPhone models

By Wissuta Sangtong

In my opinion, I think Apple is very famous of the world. People in the world use apple brand in the office and use mobile phone (iPhone) to communication because It's easy to use with icon of screen on mobile phone that can help old people can use. After I read this topic I think that there will be many people switching from Android to Iphone-5C. There are many people fed up of there low cost android phone that does not work. And finally I have been use iPhone because the application are free that make me upload many game on my mobile phone .it's save my money to enjoy it so much.

By Nuttarin Suktongseng

Newaday, I think mobile phone is the important thing for everybody. Someone use iphone 5s but I don't have because it's very expensive 555. It can update new version or other applicats. It's suitable for teens and working age. Although nowaday I don't have iphone5s but next time I will buy it "promise" 555

By Suchada Kimton

I think that Apple is brand name to has famous and quality. Now, iPhone 5s and 5c launches of new phones, so people to interest with iPhone 5s and 5c. iPhone 5s design to modern has a fingerprint sensor built into the phone's main button. Although, iPhone has very expensive price but someone want to buy it. I like iPhone so much because It was design very beautiful and use easy.

Week 4 Poem: Will You Tie My Shoes When I Grow Old

By Witsumitta Jaisamud

When reading this topic, I think a person who is my mother because she is creator. She be pregnant in 9 month and she endure very much for me and she forgiveness always. She never hope consideration from me and she gave everything always when I want and when I made a mistake, she said to me " Don't worry but not made is second "I feel very happy and proud. My mother is the best for me. She must working very hard for send I study and for future of me. I know she love me by actions of mom. She look me is children always and I pure for mom. I look mom is person who sacrifices oneself and giver than who. I love mom in the world forever.

By Salameeya Era

It's show that love from who is mom is a great. Mom can do everything for me and she needs me care her as she care me when I was baby. As I see and read this poem then make me think of mom. I will not make mom cries anymore and take care her for live.I promise.

By Jariya Utaikaseam

when i read this poem. I thing to my mother. It's talk about the person who take care of child. I love my mother. She is a best women for me.

Week 5 Short Story: English is Confusing

By Yuwadee Rungsawang

English is my favorite. But I can't speak and write it well. Because in the elementary school. I do not intend to. But today I know that what is past. It may affect us in the present. However, it would be difficult and tedious. I had to fight with it. Finally of the story above, I have read that as a teacher I would cheer all teachers as well.

By Panida Sutthi

I think, English is very confuse. Sometimes one word there are several meaning. Some word there are the same pronounce. So it can make the student confuse and scare to speak or learn. One thing that I think it can help them; vocabulary. If there are more vocabulary in your mind, you don't worry with any problem. I think like that.

By Nurisan Gupoo

I think school is a place where one goes to learn but i also believe that there should be times where fun is necessity. That is why I think the teacher should have fun with the students. Kids learn faster when they feel attracted to an exciting lesson. There are all types of teachers some are better than other. Through my life I had some professors who were well prepared and some who were not!

5. Discussion

This chapter is divided into two sections: students' comments on topics in Blogs and students' attitudes towards blogs using

Section 1: Students' comments on topics in blogs.

There were 28 comments from 28 students in each topic. Here some examples of their comments. Giving comments on each topic for five weeks required to encourage students to think about their learning, researchers have used the term *reflection* to represent different levels of thinking, such as content-based reflection, meta-cognitive reflection, self-authorship reflection, and intensive reflection (Grossman, 2009). The students reflected their thinking freely and gave comments on each topic without caring about the correct grammar.

"Well, I agree with the text "we also know so little about eating" that mentioned above. I don't want to say HOW CAN WE GROW UP UNTIL NOW? but I want to say HOW CAN WE LIVE LONG FOR A CENTURY? You know it's depends on how we are eating? Be smart paying and choosing for market and shopping for food cooking. Be smart for eating; we must know what kinds of food good or bad effect to our health. These are some methods for us to LIVE LONG FOR A CENTURY. YOU KNOW WHERE IS MOSTLY ILLNESS FROM? It's from our eating for the answer so don't forget "Health is wealth". or " In my opinion,I think Apple is very famous of the world. People in the world use apple brand in the office and use mobile phone (IPhone) to communication because It's easy to use with icon of screen on mobile phone that can help old people can use. After I read this topic I think that there will be many people switching from Android to Iphone-5C. There are many people fed up of there low cost android phone that does not work. And finally I have been use iPhone because the application are free that make me upload many game on my mobile phone .it's save my money to enjoy it so much."

Those comments reflected their value in a form of learning process through individual experiences (Wu & Looi, 2012). Reflection is a part of learning gain by the learners own experiences. Denton (2011) says reflection is a humans' ability of high-order thinking and to connect their thoughts.

In a discussion of learner independence, here *learner autonomy* and *learner independence* are mentioned and sometimes they are interchangeable, but this could lead to misunderstandings. *Autonomy* can mean control while *independence* means self-sufficient. However, independent learning, according to Sheerin (1997, p. 56), defines independent learning as having strategy development. The students' comments below show that they studied independently or were autonomous learner. Holec (1981) said that it involves taking charge of one's learning and being responsible for all the decisions related to all aspects of the learning process including setting objectives, choosing methodology, and evaluating what has been learned". Besides, they expressed their opinions without caring about correct grammar.

"While i sited on the chair to this song. I ever hear just recently, But i never to found mean it. Until now i'll must searching HaHAHAHAH after i understood to mean of song I'll get to love .It convey definition " true love" I sit on the chair with listen this song First! i thought my mom and close friend (man) especially my mom because nobody come can to replace true love like a mom. I like her (Celine Dion) i love her

inner beauty& good voice. I got feel want to smile and cry i believe that "love" when appear what times...it's always beautifully.^-^" or " When reading this topic, I think a person who is my mother because she is creator. She be pregnant in 9 month and she endure very much for me and she forgiveness always. She never hope consideration from me and she gave everything always when I want and when I made a mistake, she said to me " Don't worry but not made is second "I feel very happy and proud. My mother is the best for me. She must working very hard for send I study and for future of me. I know she love me by actions of mom. She look me is children always and I pure for mom. I look mom is person who sacrifices oneself and giver than who. I love mom in the world forever." or " I think, English is very confuse. Sometimes one word there are several meaning. Some word there are the same pronounce. So it can make the student confuse and scare to speak or learn. One thing that I think it can help them; vocabulary. If there are more vocabulary in your mind, you don't worry with any problem. I think like that".

Section 2: Students' attitudes towards Blog using

After the five week tasks, the participants were given the questionnaire inquiring on their perceptions of blogs using.

100% agreed or strongly agreed that blogging improves their critical thinking, problem solving and communication skills while only one-half of the students were neutral to they could evaluate their writing ability. Approximately 70% of the students agreed or strongly agreed that free-writing was too difficult. However, more than 90% of the students indicated blogs could help them learn how to write, they learned and used new vocabulary and they improved their writing skills. Ward (2004) found that most students benefited from the blog and helped with language acquisition and saw a rise in interest in reading and writing skills development.

About 85% of the participants preferred online discussion to face to face, could express ideas in the online discussion. Blogs improve the classroom environment and encourage students to apply their knowledge and interpretation (Cashion and Palmieri, 2002, p.157), blogs are being used to enhance and supplement classroom environments while 21.43% of the students disagreed or slightly disagreed that it was easy for them to discuss an issue in English in the online discussion. Only one participant disagreed that he or she felt comfortable with technology. Moreover 35.71% strongly agreed that they felt uncomfortable to give comments when others knew who they were. 85% of the students were more comfortable with listening tasks than reading and writing tasks. 57.14% of the participants agreed that the assignments in blogs were too time consuming. More than 90% agreed that blogging supports collaborative learning both in knowledge development and group sharing.

6. Conclusion

Blogs are easy-to-create and easy-to-maintain websites (Pinkman,2005). They provide a practice environment where students can think, reflect, and create language for a real-life audience outside class and encourage learner independence.

Using blogs could promote the students to be independent learners because they understand the tasks by doing rather than by instruction. All students agreed that they could improve their critical thinking and communication skills. Some students felt uncomfortable to give comments when others knew who they were. However, Most of the participants preferred online discussion to face to face, could express ideas in

the online discussion. Many students agreed that free-writing was too difficult while nearly all the students indicated blogs could help them learn how to write, they learned and used new vocabulary and they improved their writing skills. Few students disagreed that it was easy for them to discuss an issue in English in the online discussion. Half of the students agreed that the assignments were too time consuming. Nevertheless, more than 90% agreed that blogging supports collaborative learning both in knowledge development and group sharing.

7. Suggestion

It is suggested that further study to investigate more interaction among the students and how social network influence the students' learning should be conducted.



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YouTube. Because you loved me with lyrics - Celine Dion. Retrieved September 9, 2013 from <http://www.youtube.com/watch?v=Nq8TasNsgKw>

Digital Literacy Skill of Students in Public Higher Education Institutes

Piatip Phuapan, King Mongkut's Institute of Technology Ladkrabang, Thailand
Chantana Viriyavejakul, King Mongkut's Institute of Technology Ladkrabang, Thailand
Paitoon Pimdee, King Mongkut's Institute of Technology Ladkrabang, Thailand

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Abstract

This research has the objective of studying the digital literacy skill of students in public higher education institutes. A qualitative research technique using focus group interviews 6 experts in digital learning, education science and teaching methodology, who are selected by purposive sampling. By analyzing the principle, and the parts constituting digital literacy skill of students in public higher education institutes, it is composed of 6 elements. 1) Access, this is the ability to identify the source of the data, including the ability to acquire and collect the data and to retrieve such data for repetitive usage. 2) Manage, this is the ability to use the resource which is correct and the easiest for assessment. 3) Integrate, this is the ability to relate with all other constituents. For digital literacy, this also includes the ability to deduct and interpret the meaning of the information via the ICT devices. 4) Evaluate, this is the ability to assess the timeliness and the usefulness of the information. 5) Create, this is the ability to understand and apply the advantage offered by the suitable media creating devices. 6) Communication, this is the ability to contact and interact with other individuals in the digital environment.

Keywords : Digital Literacy, Digital Literacy Skill, Higher Education

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Introduction

Today it is true to say that, in most of parts of the world, we live in a digital society, a society permeated by the digital, in which our actions are frequently mediated by digital tools, and the objects we encounter are often shaped by digital intervention. The mobile phone and the MP3 player are the most visible personal artifacts of this society, whilst the PC is the ubiquitous gateway to cyber-activity, at work and at home. Yet it would be wrong to think that we live in The Digital Society, for this suggests that society is made by the digital, that its essential characteristics have been created because of the development of digital technology (Martin & Grudziecki, 2006).

For the education, it is encouraged that the learning activity is given importance to the learners and that the learners should be able to create the knowledge subjects that they consider relevant. For the 21st century, the learners must have the suitable skill to access, assess, use, manage and enrich the vastness of the data. The media of today and tomorrow are the digital tools. The learners have the historical power to enhance their abilities to learn, communicate, work and create collaboratively. With this power, there is the need to learn the suitable skill to manage the large amount of data, information, media and technology. This is known as “Digital Literacy.” (Bernie & Charles, 2009:7) As we develop the learners’ skill with digital technology, it is necessary to be aware of the change in the technology, which is called “Literate.” “Literate” has a very large meaning. It is about the parts of the writing, the message with a pattern and a script, graphical interpretation, web site access, media management and understanding (Asselin & Moayeri. 2011; Poore, 2011) as referenced in Marion Milton. 2013: 75.

Office of the Higher Education Commission (2009) made Thai Qualifications Framework for Higher Education (TQF:HEd) amended and in order to set the clear target of producing graduates. The results of the learning expectations of graduates in each of the courses/ Field / Program / Division. The qualification standard framework of national higher education expect at least 5 learning outcomes for graduates by following: 1. Ethics and Morals. 2. Knowledge. 3. Cognitive Skills. 4. Interpersonal Skills and Responsibility. 5. Numerical, Communication and Information Technology Skills. The researcher, therefore, is interested to study the parts that constitute the “Digital Literacy Skill of Student in Public Higher Education.” This will provide the frame for the idea needed to create the tools to help develop the “Digital Literacy Skill” for an individual such as teachers and students, to develop the learning media, to support other necessary and important skills, to be used as a learning tool and to be used as a guideline for the practice which supports the lifelong learning and for the working in the digital society.

Research Objectives

The objective of the research is to study the Digital Literacy Skill of students in public higher education institutes.

Data Sources/Data Providers

This study is the qualitative research in a form of focus group. Samples are the 6 experts in digital learning, education science and teaching methodology.

Tools and Quality Assessment

The tool used in the research is the interviewing forms which is designed based on the information obtained from the referenced documents, text books and other research articles which are relevant or related, ideally or theoretically to this study.

The quality assessment for the research is conducted via the evaluation from the thesis advisor.

Data Analysis/Interpretation

The analysis on the data is based on “Content Analysis.” It is used to explain the meaning of principle and the constituents of the “Digital Literacy Skill of students in public higher education institutes”.

Research Methodology

In this study, the data for the research are collected according to the following procedure.

1. Study the documents and the research articles related to the “Digital literacy skill.”
2. Prepare the interviewing forms for the group on “Digital Literacy Skill” and have it presented to the thesis advisor.
3. Conduct the “Focus Group” meeting. A total of 6 experts are to be invited to the “Focus Group.”
4. Analyze the data obtained from the “Focus Group.”

Digital Literacy Skill

CETF (2008) defined that the digital literacy is ability to use digital technology and communications tools, and/or networks to access, manage, integrate, evaluate, create and communicate information in order to function in a knowledge society. Ilomäki et al(2011) stated that the digital competence is the most recent concept describing technology-related skills. In recent years, several terms have been used to describe the skills and competence of using digital technologies, such as ICT skills, technology skills, information technology skills, 21st century skills, information literacy, digital literacy, and digital skills. Ala-Mutka (2011) also shows elements of digital literacy clearly. Digital Literacy have overlapping areas with Information Literacy, Media Literacy, ICT Literacy and Internet Literacy showed in Figure 1.

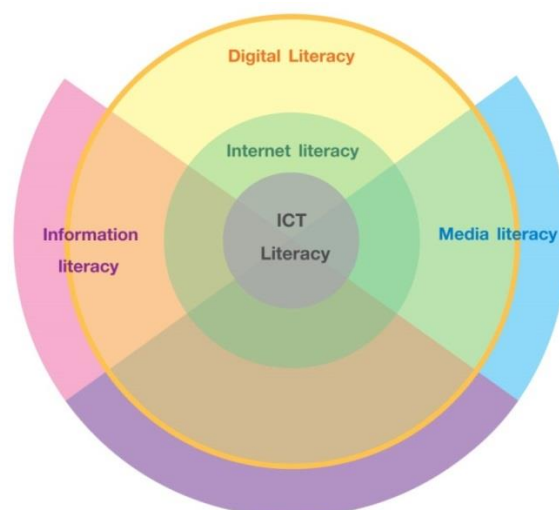


Figure 1. Mapping Digital Competence : Towards a Conceptual Understanding. (Ala-Mutka, 2011)

Figure 1 illustrates how the typical definitions make the concepts overlap considerably. Different interpretations of the concepts make it impossible to have a general agreement about the exact overlap in relation to different digital competence areas. This figure follows from the concept discussion above, and aims to show the following main points:

- **ICT literacy** is typically the narrowest digital concept, and mainly concentrated on technical knowledge and usage of computers and software applications.
- **Internet literacy** adds to the tool-related knowledge and skills the considerations and ability to successfully function in networked media environments.
- **Information literacy and media literacy** concepts largely overlap. However, some different focuses can be detected in that information literacy is more about finding, organizing and processing information, whereas media literacy is more about having the skills to interpret, use and create media for one's own benefit and participation. A critical attitude is important in both of them.

Thai Qualifications Framework for Higher Education (TQF:HED)

Office of the Higher Education Commission (2009) made Thai Qualifications Framework for Higher Education (TQF:HED) to be a mechanism or a tool for setting a policy to improve the quality and standards of education as defined in the Education Act of 1999 which was amended and in order to set the clear target of producing graduates. The results of the learning expectations of graduates in each of the courses/ Field / Program / Division. The qualification standard framework of national higher education expect at least 5 learning outcomes for graduates by following:

1. Ethics and Morals. (E&M) Development of:
 - Habits of acting ethically and responsibly in personal and public life in ways that are consistent with high moral standards.
 - Ability to resolve value conflicts through application of a consistent system of values.
2. Knowledge. (K), the ability to understand, recall and present information including:

- Knowledge of specific facts,
- Knowledge of concepts, principles and theories and
- Knowledge of procedures

3. Cognitive Skills. (C), the ability to

- Apply knowledge and understanding of concepts, principles, theories and procedures when asked to do so; and
- Analyze situations and apply conceptual understanding of principles and theories in critical thinking and creative problem solving when faced with unanticipated new situations.

4. Interpersonal Skills and Responsibility.(I&R), the ability to;

- work effectively in groups, and exercise leadership;
- accept personal and social responsibility, and
- plan and take responsibility for their own learning.

5. Numerical, Communication and Information Technology Skills. (N&ICT), the ability to

- use basic mathematical and statistical techniques,
- communicate effectively in oral and written form, and
- use information and communications technology.

Bloom's Digital Taxonomy

Churches (2009) shows that Bloom's Revised Taxonomy is key tools for teachers and instructional designers. Bloom's Revised Taxonomy account for the new behaviours, actions and learning opportunities emerging as technology advances and becomes more ubiquitous. The details show in the figure 2.

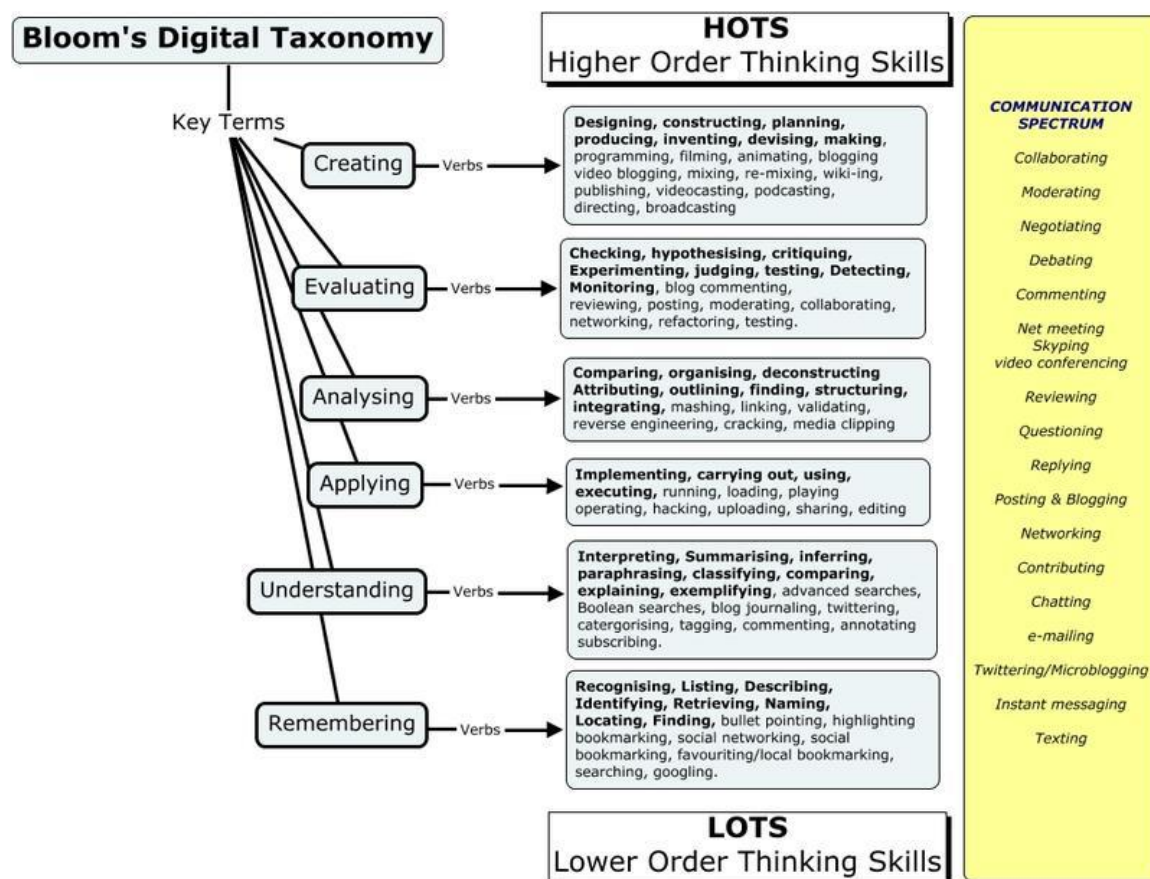


Figure 2. Bloom's Digital Taxonomy. (Churches, 2009)

Result

Digital Literacy Skill of Students in Public Higher Education Institutes

From the study of documents and related research, the framework idea of 21st century skills about the technology using standards for the students of The International Society for Technology in Education (ISTE) found that there is no standard for digital literacy knowing in higher education. It also has not set any standard for digital literacy skills to students in higher education of public higher education institutes yet. So that this study has concluded the concept, theory and factors of digital literacy knowing, as shown in Table 1 and 2 considering along with Thai Qualifications Framework for Higher Education (TQF:HEd)

For the analysis of synthetic concepts and components of Digital Literacy Skill, the researcher has conducted the digital literacy skill of students in public higher education institutes draft. Design a structured interview and focus group meetings six experts in the digital learning, the education science and the teaching methodology. Details showed in Table 1.

Table 1 : Mapping Digital Literacy Skill with TQF

Elements	Define	Competency	TQF:HEd				
			E & M	K	C	I&R	N&ICT
1.Access	Knowing about and knowing how to collect and/ or retrieve information	Access information sources as well as having the techniques for collection and retrieval of such information, is a basic component of all literacies	✓	✓	✓	✓	✓
2.Manage	Applying and existing organizational or classification scheme.	Conduct a rudimentary and preliminary organization of accessed information for retrieval and reuse.	✓	✓	✓	✓	✓
3.Integrate	Interpreting and representing information summarizing comparing and contrasting.	Interpret and represent information by using ICT tools to synthesize summarize compare, and contrast information from multiple sources.	✓	✓	✓	✓	✓
4.Evaluate	Making judgments about the quality, relevance, usefulness, or efficiency of information.	Judge the currency, appropriateness, an dedequacy of information and information sources for a specific purpose	✓	✓	✓	✓	✓
5.Create	Generating information by adapting, applying, designing, invention, or authoring information.	Adapt, apply, design, or invent information in ICT environments.	✓	✓	✓	✓	✓
6.Communicate	Communicate information persuasively to meet needs of various audiences through use of appropriate medium.	Communicate, dapt, and present information properly in its context in ICT environments and for a peer audience.	✓	✓	✓	✓	✓

Table 1 The synthesis of the views of experts combined with the learning expectations of graduates shows that digital literacy skills are composed of six elements. Each element should have all five learning outcomes for graduates and are: Ethics and Morals, Knowledge, Cognitive, Interpersonal Skills and Responsibility, Numerical and Communication and Information Technology Skills.

Table 2 : Mapping Elements of Digital Literacy Skill with Bloom's Digital Taxonomy

Elements	Competence	Bloom's Digital Taxonomy (Keywords)	Digital Literacy Skill of Student in Public Higher Education (Keywords)
1.Access	Access information sources as well as having the techniques for collection and retrieval of such information, is a basic component of all literacies	Remember : Recognizing, Listing, Describing, Identifying, Retrieving, Naming, Locating, Finding,	find, search, browse , retrieve, tag, navigate, locate
2.Manage	Conduct a rudimentary and preliminary organization of accessed information for retrieval and reuse.	Understanding : Interpreting, Summarizing, Inferring, Paraphrasing, Classifying, Comparing, Explaining, Exemplifying	capture, collect, store, classification, delivery
3.Integrate	Interpret and represent information by using ICT tools to synthesize summarize compare, and contrast information from multiple sources.	Applying : Implementing, carrying out, using, executing, Implementing, showing, exhibiting Analyzing : Comparing, Organizing, Deconstructing, Attributing, Outlining, Finding, Structuring, Integrating,	interpret, represent, summarize, contrast , implement, using
4.Evaluate	Judge the currency, appropriateness, an dedequacy of information and information sources for a specific purpose	Evaluating : Checking, Hypothesising, Critiquing, Experimenting, Judging, Testing, Detecting, Monitoring	judge the currency, appropriateness, and adequacy of information compare, organize, deconstruct
5.Create	Adapt, apply, design, or invent information in ICT environments.	Creating : Designing, Constructing, Planning, Producing, Inventing, Devising, Making	design or invent, pull-related issues, adapt, apply, utilize
6.Communicate	Communicate, dapt, and present information properly in its context in ICT environments and for a peer audience.	Communication : Collaborating, Moderating, Negotiating, Debating, Commenting, Reviewing, Questioning, Replying,	communicate, adapt, and present

		Posting, Contributing, Chatting	
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Conclusion

By analyzing the principle and the parts constituting the digital literacy skill of students in public higher education institutes, it is understood that the digital literacy means the ability to use the digital technology, the communication devices and the network in the digital environment to live the life efficiently. That is composed of six elements;

1) Access 2) Manage 3) Integrate 4) Evaluate 5) Create and 6) Communicate.



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Cross-Cultural Investigation of Eye-Gaze Patterns for E-Learning Content Optimization

Toshiro Takahara, Kobe Institute of Computing, Japan
Samiullah Paracha, Kobe Institute of Computing, Japan

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Abstract

E-Learning in developing countries is still in a marginal state, mainly because of the cost of its introduction, and the lack of human resources to maintain the system. But the situation has changed and the price of the e-learning device has become affordable. So far, a large part of educational material is simply imported from developed countries. Because of this situation, the learners are confronted with diverse challenges. Poor availability of educational material for early age children, the need to use and learn two or more languages, and a strong oral tradition make the situation more difficult. To alleviate this issue, the optimisation of educational material is a necessity. E-Learning material are easy to customise compared to books. But the customisation must be done in an appropriate manner according to the culture of target users. Using eye tracking technology enables a deeper cultural analysis on e-learning materials to optimise its efficiency. Eye tracker captures the reaction around the border of consciousness and it reflects the subject's background culture much more than his/her intentional choice. This technology is widely used in web design, marketing, psychological research and cognitive linguistics. This research focuses on the analysis of how people of different cultural background interact with various contents of e-learning material such as, text, image, graphics, symbols and colors. The result of each test will provide important data to help with designing appropriate e-learning material for each country.

Keywords: e-learning, culture, eye tracking

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Introduction

Education is the most important sector in development. E-learning is a prominent solution to overcome the limitations in developing countries. But the reality is, many e-learning projects fail. There are factors which lead the projects' failures; the nature of the project, management failures and human resource failures.

Technology driven projects are easy to fail, and often make the users say "We prefer traditional materials/methods". There are e-learning projects which face fierce contestations of the teachers, because the teachers feel threatened. Because of the number of failures and difficulties, fund providers started to avoid the e-learning project. The most important part of e-learning project is the quality of contents. Another important factor is the quality of learning interface. These two factors are interrelated and indissociable. E-learning is more human science than computer science, since the aim of e-learning is to make the humans learn. So e-learning must tackle with the human complexity, and the core technology is the interface design. Interface design is how to make the accurate user perception by the stimulus created by the computers. It is also called User Experience (UX).

Despite its importance, interface design is often underestimated. Because the good design is clear, transparent and invisible to most of the users. We don't know how the students of the target culture interact with various e-learning materials. What kind of contents they are attracted, what is the best position of contents, what is their color preference, etc.

The aim of this research is to establish a method to analyze the gaze patterns on e-learning materials using eyetracking technology. E-learning materials are composed by various elements. Text, graphic, colors, photographs, illustrations, videos and sounds. Some are static, some are dynamic and some are interactive. According to the learning objective and the instruction type, appropriate media types must be chosen in order to compose an optimised material.

Literature review

Eye tracking technology is vastly used in marketing and web design field. Nielsen J. and Pernice K. explored the web usability using eye tracker in their book titled "Eye-tracking Web Usability" published in 2009. This book is considered as a reference for the studies of eyetracking.

According to the vast literature review (Educational Research Review 10, 2013) by Meng-Lung Lai et al. on the use of eye-tracking for learning research, eye-tracking is a recent technology and its use is increased from 2009. They listed 77 academic papers in the field of language learning, perception, conceptual development, psychology and sociology, and built a framework between eye-movement and learning.

There are several researches on the eye-gaze difference in multi cultural settings, but they are usually limited between Americans or Canadians (often referred as "westerners") and Japanese or Chinese (often referred as "Asians"). (Boland J. et al., 2008, Griffiths L., Chen Z., 2007, Lu Z. et al. 2008) But Ron Scollon et al. pointed out in the book "Intercultural Communication, A Discourse Approach" (Third Edition,

2012) that this binary comparison between “westerners” and “Asians” are too simplified and the result can be erroneous.

Marcos M.C. et al. conducted a research on Cultural Difference on Seeking Information: An Eye-Tracking Study (2013), between Middle Eastern and Western Europeans about the interaction with search engine result pages.

Peeters M. wrote a thesis on Consumers’ information needs on e-commerce websites, A cross-cultural eye tracking study. This study geographically targeted Western Europe, Columbia and South Africa. This study is similar to our research but the geographical target zone is different and our goal is focused to contribute the development of e-learning contents.

Despite the considerable number of research done, there is no specific study for the use of eye tracking technology for e-learning in developing countries.

Methodology

Kobe Institute of Computing has an international environment, its students are composed of Asian and African countries. Since the aim of this research is to clarify the difference of gaze patterns caused by cultural difference, this environment can be an appropriate situation.

Test A consists on general observation of eye gaze pattern of interaction with various elements of e-learning materials. We prepared 15 images on different themes. Eye tracker test total time is 3 minutes and 35 seconds.

Test B is more focused on composite e-learning materials, and the aim of the test is see the level of understanding using the different kind of informations and representations. The post-test questionnaire contains some questions about the contents of the materials. Participants are instructed this procedure before the eye-tracking test. Test time is 4 minutes and 57 seconds.

Participants:

Nationality	Test A		Test B	
	Male	Female	Male	Female
Afghanistan	4	0	5	0
Japan	1	1	1	1
Tanzania	0	0	0	1

Hardware configuration:

Monitor: 19 inches and a display resolution of 1,280 × 1,024

Eyetracker: The Eyetribe ET1000 Batch 2014-04

Software configuration: Eye gaze recorder: Eyeproof recording suite

Testing Materials

Test A1: Color Dots (5 Seconds)

We prepared an image with 15 circles of different colors. I used 12 standard colors based on CMYK model. I added 25%, 50% and 75% grey. I chose circle because it does not have any particular bias which guides the movement of the eye. I scattered randomly the 15 color circles on a white background.

Test A2: Color Hex (5 Seconds)

We created a hatch of black hexagons and put 4 different color associations. These associations are inspired by the national flags. Blue-White-Red is from the french flag, Green-White-Red is from italian and afghan flag, Red-Yellow-green is very common color scheme on african countries, Red-Yellow-Light Blue is from Rwandan flag.

Test A3: Kryptonian Text (5 Seconds)

The aim of this test is to see the unintentional orientation of the gaze. But normal text which the subjects are used to see, there's preset direction to read it. So the character set should be something that the subjects have never seen. The character set we used is called "Krypton font" of a fictional language created for "Superman".

Test A4: Emoji (8 Seconds)

Emoji is an expression of text represented by graphic symbols. It is widely used now among young people. This mode of text communication is not a conventional, and it can be considered as a new method of communication. The aim of the test is to see how the subjects interact with these graphic symbols.

Test A5: Cartoon (6 Seconds)

Cartoon is a mixture of two method of communications; text and image. The aim of this test is to see the interaction of subjects to this mixed communication methods.

Test A6: Hypertext (15 Seconds)

Hypertext is a basic style of web contents. The aim of this test is to analyse the standard pattern of the subjects with the standard web contents.

Test A7: Diagram (10 Seconds)

Diagram is a graphical representation of cause-effect text contents. The graphical attributes (form, color etc) have very little connection with the semantic information of the whole diagram. The aim of this test is to analyse if the participant will follow the logical connections or they will see the image randomly.

Test A8: Text Graphic Composite Document (10 Seconds)

This type of content is also very common in academic document and e-learning material. Actually there are several combinations of different kind of contents. This time I used the combination of bar graphs and text. The aim of this test is to analyse another standard pattern of the subjects with standard academic document.

Test A9: Table (15 Seconds)

Table is an another representations of cause-effect text contents. There's less importance of graphical features compared to diagram. But it has a predefinition of the

order of the contents. The contents on the left top is a privileged position, and the user can read the table horizontally or vertically according to user's preference.

Test A10-13: Moodle Experience (4 Different Images)

This test contains 4 different images of a very common MOOC platform. The aim of this test is to compare the gazing pattern on different pages and to analyse the optimised pattern of contents disposition.

Test A10: Moodle Main Page (15 Seconds)

Moodle is a very widely used open source e-learning solution. Moodle is very flexible and we can customise it easily. This image is the Moodle page after login process. This is the most basic and simple page disposition pattern. The contents is limited to text.

Test A11: Moodle Class Contents Page (15 Seconds)

This image is common Moodle class main page. There are much more text contents compared to Moodle main page, but there is no graphic contents.

Test A12: Coursera Class Contents Page (15 Seconds)

Coursera is a common MOOC platform. Coursera main page is much more media rich and colorful, but the standard class page is very similar to Moodle class content page. There are some graphical objects placed in this page.

Test A13: Moodle Re-Designed Main Page (10 Seconds)

We re-designed the Moodle main page to improve the usability and experience of Moodle using mainly different colors and simple graphic objects. This image will show how the gazing pattern will change with modification.

Test A14: Escher Test (8 Seconds)

Escher is famous by his "trompe oeil" paintings. This painting is 3 mirroring image of the quarter. And it contains various sub images of animals. This painting is a totally flat two dimensional image. The aim of this test is to see the interaction pattern with the different design element of this picture.

Test A15: Velasquez Text (8 Seconds)

This painting has a very complex structure, and there are elements on a various depth level. The main contents ("*Las meninas*", The girls in Portuguese) are in the middle of the contents. In front of the girls, there's a dog on the right and the back of the canvas. And behind the girls, there's the painter at the left. Also, there are 2 adults on the right. Behind these characters, there's a wall with a mirror in the middle and a doorway at the right. And there's a man in the doorway. The difference of this material is this three dimensional contents positioning. The aim of this test is to analyse the depth of gaze of the subjects.

Test B1: Text Interaction (60 Seconds)

This testing material contains only text. I chose Japanese Language as theme, because it's a common field of interest among the participants. To avoid the bias, I chose questions that Japanese participants cannot answer without reading the text.

Test B2: Text And Images (60 Seconds)

This material is a text with some related images (photographs). These photographs are a simple representation of the theme of the text, and not exactly related to the asked questions. Therefore, the image contents are simple noise as semantic information. The answers to the questions are clearly stated in the text. The theme of the text is Hanami, which is in the field of common interest of all the participants.

Test B3: Text And Logos (60 Seconds)

This material is composed by text and logos of the organisations which appears in the text. Logos contain mainly text elements which also appears clearly in the text. The question is asked about these informations, which appears in both text and image. The theme of the text is World Wide Web, and it is in the common field of common interest of all participants, but different from the former tests.

Test B4: Text And Images (60 Seconds)

This material is composed by text, images and logo. Images and logos are directly related to the contents of the text. This time, the logo does not contain text. But images are not the simple representation of the theme of the text. They have their own meanings, therefore they are semantic representations. The questions are asked about the graphical contents of the image which do NOT appear in the text, and about the graphical attributes of the image like colors and forms.

Test B5: Color Random Dots (10 Seconds)

This is the similar materials I used in the previous lab test. The difference is the timing of the test. In previous lab test it was the first test material, and it seems the participants were not ready to interact with testing materials.

Test B6: Color Circular Model Dots (10 Seconds)

This is a similar test as test 5, only the dots are arranged in circular position. Because all the elements are placed at the same distance from the middle of the screen. This difference has an importance because the arrangement of dots gives a "form" and this fact implants a particular meaning and logic to the participants. This can be affect the gaze patterns of the participants.

Test Procedures

Pre-test questionnaire is a verbal session consists on the acquisition of general informations about the participant, a screening questions about their eyes and english proficiency, a small survey about their preference and experience of media interactions. I gave them instructions about eye tracker and how to interact with the materials. I explained to them that there will be some questions about the contents of the test, after the eye-tracking test.

Eye-tracking test is the interaction with test materials using eye-tracker.



Figure 1: Eyetracker test

Post-test questionnaire is a written survey, that participants can do immediately after the eye-tracking test. The questionnaire was built using Google forms, and the results are automatically sent to Google sheets. This questionnaire is composed by some very simple questions about the contents of testing materials with multiple choice answer and check-box style answer, general impressions about the test.

Results

Test A1: Color Dots

We can see the similarity on the high concentration of gaze in the central zone of the screen. And there are few gaze on the peripheral zone. We can see a difference between Afghan students and Japanese students. The gaze pattern of Japanese students are scattered in wide range. The gaze pattern of Afghan students are rather concentrated to a small area at the center of the image.

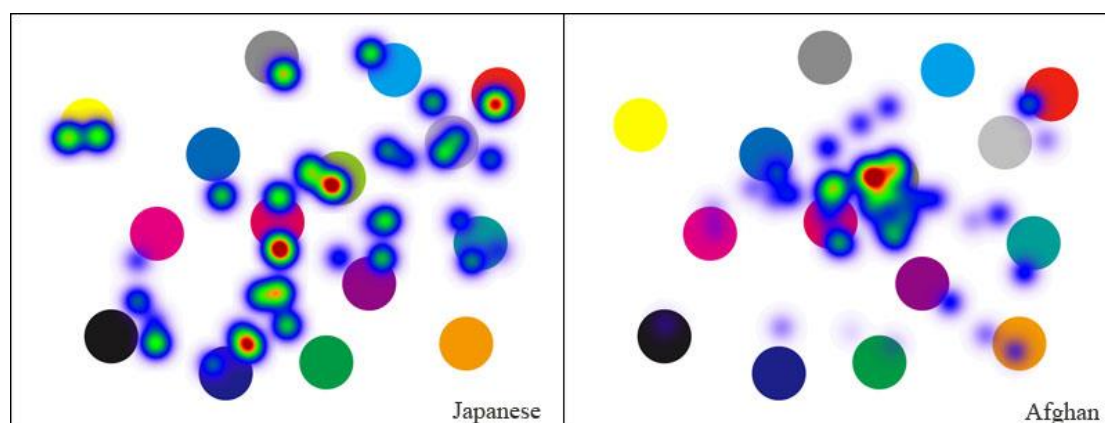


Figure 2. Gaze pattern difference between Japanese and Afghan participants

Test A2: Color Hex

Unlike the previous test, the difference is difficult to analyze. The very strong gaze concentration of the Afghan students at the center of the screen can be translated to the attraction of black color.

Test A3: Kryptonian Text

The result of this test is also very difficult to explain. Actually there are no significant difference between Afghan and Japanese participants. We hypothesize that the kryptonian text is recognized as image instead of text.

Test A4: Emoji

All the participants spend more time on decrypting the symbol & text mixed part, but Japanese participants are slightly more attracted by stamps compared to Afghan participants.

Test A5: Cartoon

We can observe 2 significant differences. Japanese participants are less attracted the text element embedded to the image, and are attracted by graphical expression. Afghan participants have more concentration on pirates flag than the pirate's face.

Test A6: Hypertext

This test present a very similar pattern on both participants.

Test A7: Diagram

This test present a very similar pattern on both participants.

Test A8: Text Graphic Composite Document

This test present a very similar pattern on both participants.

Test A9: Table

The table used for the Test A is called logframe, which shows logical connection horizontally and vertically. This was too complicated to the test. We should have made a simple table.

However the disposition of gaze pattern were different. Afghan participants present a strong horizontal movement. Japanese participants present more vertical movements.

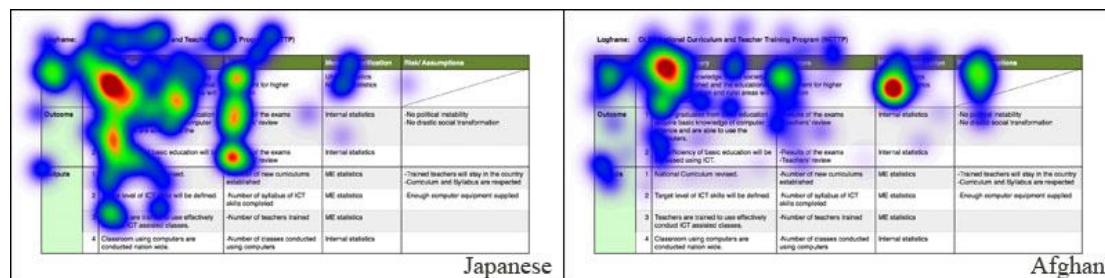


Figure 3: Eye gaze pattern on Table

Moodle Experience (4 different images)

This test contains 4 different images of a very common MOOC platform. The aim of this test is to compare the gazing pattern on different pages and to analyse the optimised pattern of contents disposition.

Test A10: Moodle Main Page/Moodle Class Contents Page

On the main page, Japanese participants concentrated the gaze on navigation pane (Left). Afghan participants' gaze pattern is similar to Contents page, making the concentration on Contents pane. On Class contents page, Japanese participants concentrated the gaze on Contents pane.

Test A11: Moodle Class Contents Page

This image is common Moodle class main page. There are much more text contents compared to Moodle main page, but there is no graphic contents.



Figure 4: Eye gaze pattern of Afghan and Japanese participants

Test A12: Coursera Class Contents Page

The pattern is similar to Moodle contents page, the significant difference is both Afghans and Japanese have certain amount of gaze on Title area.

Test A13: Moodle Re-Designed Main Page

This re-designed interface showed a completely different gaze pattern compared to other Moodle interface and Coursera interface. Both Afghans and Japanese scanned the whole page and the gaze is distributed. Since classical Moodle page is composed by text, the eye gaze pattern becomes text reading pattern. In the other hand, modified Moodle interface is more graphical, this difference of the contents character lead to the difference of eye gaze pattern.

Test A14: Escher

The participants are attracted the joint part of the image. I can't explain the cause of this phenomenon.

Test A15: Velasquez

The heatmap shows a slightly different gaze patterns between Japanese and Afghan students. All participants looked at the main character and scanned *Las Meninas* (The girls), but Afghans have strong gaze fix on the dog in front of the girls. The Japanese are more attracted to the background like mirror and the doorway than the dog.



Figure 5: Eye gaze pattern on Velasquez

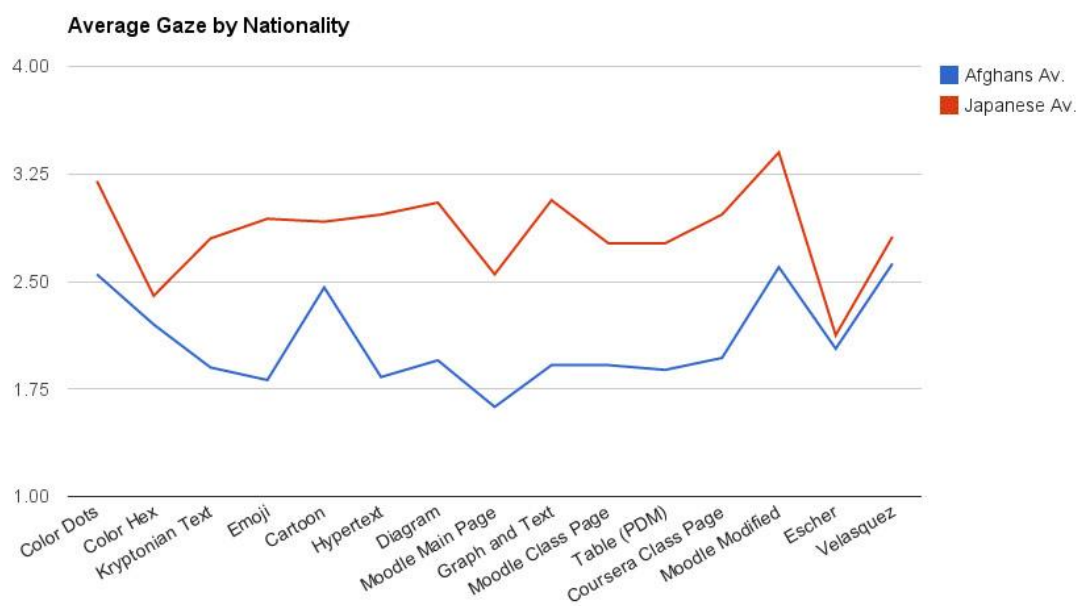


Figure 6: Gaze count

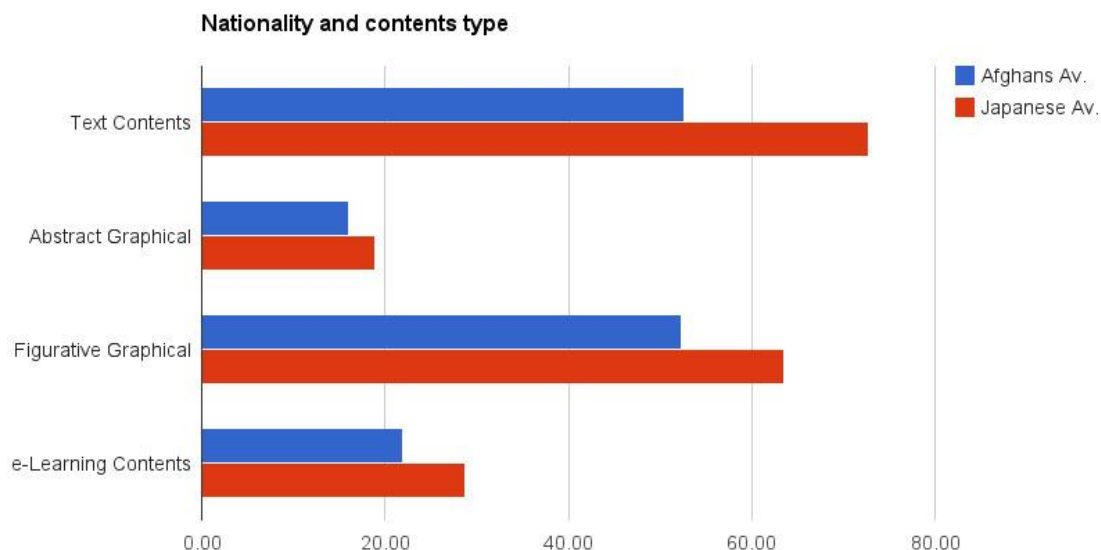


Figure 7: Gaze count by contents type and nationality

Test B1: Text Interaction

For eye tracking data, they show a standard text interaction pattern. But the results of the questionnaire show very important point of analysis. The first question was about the content of first sentence of the text, and none of the participants gave the right answer. Although almost all the participants clearly read this sentence. Maybe because I change the expression from the original text, but this result shows that the participants read the text without understanding the meaning of the text. The whole text contains 227 words. Almost all the Afghan participants read only paragraph 1, which contains 117 words, and none of them finished reading paragraph 2 which contains 115 words. This reading speed is very important, because the second question is about the contents of the second paragraph. Only one Japanese participant selected the right answer.

Test B2: Text And Images

For this material, the whole text is shorter than the Test 1, and many of the participants read the entire text (160 words). The images are placed at the bottom of the document, 3 participants did not look at the pictures. But it did not affect the results of the questionnaire since the answers are in the text and not in the images. The results are clearly better than Test 1. And it seems that all the participants understood the meaning of the questions and answers. The questions on this test is about substantive object, which can relate to the figurative images. The question on Test 1 was rather conceptual and abstract.

Test B3: Text and Logos

In this material, there are 3 text paragraphs, and there are related logos at the side(right-left:right) of each paragraph. Each logo contains the abbreviation of the name of organism or product, which are also shown in the text. The questions are to choose the right answer among the names of the related organisms or related products. Despite this double hint, the results of the questions are not very good. Mainly because of the reading speed, three participants read only the paragraph 1 (122 words), and none of them finished reading the entire text (238 words). The position of the text and image is somewhat confusing. The result suggest the uncertainty of abbreviations.

It is a common way to make the organization name or logo based on it, but it is very easy to be forgotten, or confused with other abbreviations.

Test B4: Text And Images

In this material, there are two text paragraphs, one logo at the right top of the document and two images at the bottom of the document. The questions are about the contents of graphic elements and the answers are not shown in the text. Since the text part is not long (157 words), all the participants finished reading the text. But 4 participants did not look at the logo, and two of them did not look at the pictures. Q7 is about the attribute (color) of the logo, and more than half of the participants selected the correct answer. Q8 is also about the attribute of the image, but this time it was about form. The object is placed in a black and white photography, and the painter (Pablo Picasso) is drawing a bull in a simple and abstract way. Less than half of participants selected the correct answer, and some participants say that they didn't know that the form was a bull. This fact needs a further analysis. The form was seen and recognized, but cannot be understood as a figure. So the failure occurred in semantic information process. On the creator side, the failure occurred in codification process.

Test B5: Color Random Dots

This is the same material I used in the Test A. We thought that the participants are confused with this material because it was the first image for the Test A. This time it was shown as fifth image and the results are similar to the results of Test A. So this "first time" bias does not exist. The gaze pattern of Afghan participants are usually condensed at the middle of the screen. In other hands, other nationalities (Japanese and Tanzanian) showed more widely spread eye gaze pattern.

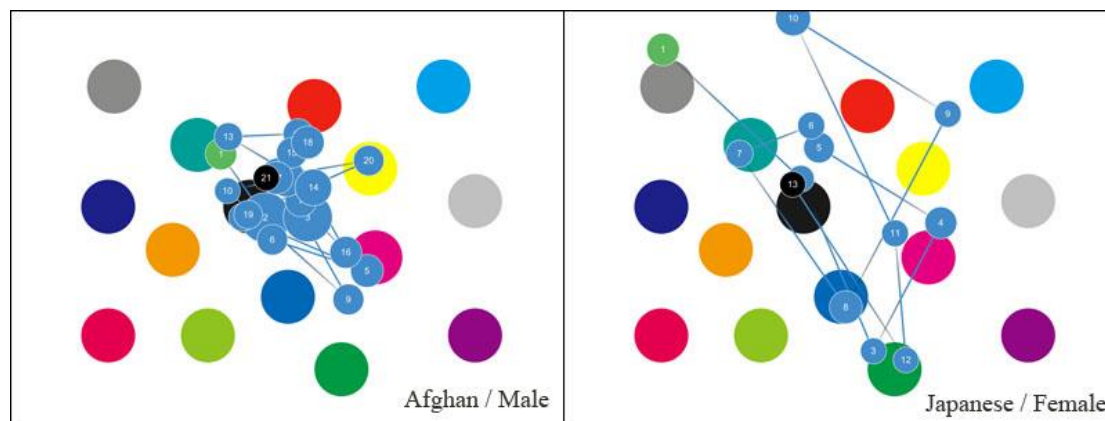


Figure 8: Male/Female gaze pattern on random color dots

Test B6: Color Circular Model Dots

The result of this test shows two interesting points. The eye gaze pattern of 5 participants show a clear circular pattern (Clockwise and anti-clockwise). It means the participants are aware of the structure of the elements. Then all the 5 participants are male. The female participants did not show this circular pattern. In other tests, I could not find any difference between male participants and female participants.

The implementation of this circular structure in e-learning material can be seen in the Sugar OS.

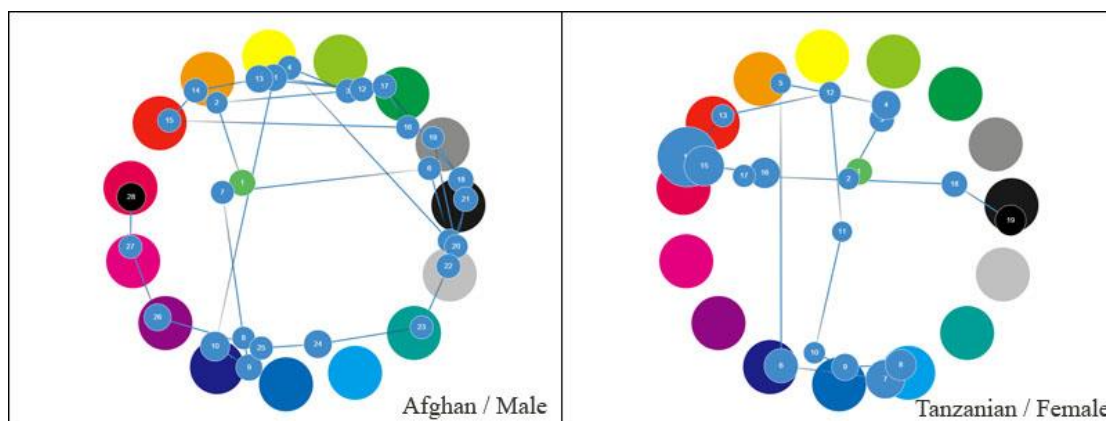


Figure 9: Male/Female gaze pattern on circular color dots

Conclusion

Our conclusion is that cross-cultural analysis of eye gaze pattern is an innovative and effective approach to optimize e-learning contents. Since this research tackle with human complexity, the approach to analyze the results is holistic. Eye gaze is easily influenced by many conditions; distraction, boredom, individual likes and dislikes. Based on these limitations, we made findings as following; (i) There are a lot of gaze pattern similarities among the different cultural groups; (ii) There is a clear gaze pattern differences between text materials and graphic materials; (iii) Afghans' gazes are concentrated at the center of the screen, compared to Japanese participants; (iv) Reading speed is a crucial factor for the text understandings; and (v) Form is a gaze guiding factor more than color, especially for male. However, this research is still in experimental stage, the data size is limited. Further research is needed to find a clear connection between gaze pattern differences and culture groups.

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- Contact email:** s13132@st.kic.ac.jp

The Result of the Study for Learning Management Suitable to Develop Blended Learning Model in IT for Education Course

Wirachat Banyen, King Mongkut's Institute of Technology Ladkrabang, Thailand
Chantana Viriyavejakul, King Mongkut's Institute of Technology Ladkrabang, Thailand
Thanin Ratanaolarn, King Mongkut's Institute of Technology Ladkrabang, Thailand

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Abstract

This qualitative research on blended learning has two main proposes. The first aim is to investigate situation of blended learning research in Thailand. The second aim is to determine recent effective environments for blended learning, its obstacle, and how to improve blended learning in an Innovation and IT in Education course. For these purposes, total of 55 graduate-level theses regarding blended learning which published during year 2006 to 2013. In addition, the research samples are a group of lecturers and 30 undergraduate students are selected by purposive sampling. Research tool used in the study is a questionnaire. The study results reveal two significant aspects. Firstly, regarding to an analysis on blended learning research in Thailand, most researches on this topic has been completed during years 2012 and 2013. The researches have been done the most by the department of Educational Technology using sample groups of undergraduate-level students who attended in academic courses related to Educational Technology subject. Moreover, the most preferred blended learning model is the one that integrate face-to-face with e-learning. Secondly, regarding to recent studying on learning environments, the study also shows that the learning environments of educational technology classes provide effective environments for implementing blend learning idea. About the obstacle of blended learning, the lecturers and students totally agree that, instead of learning by traditional face-to-face sessions alone, classroom should be more supplemented with e-learning sessions. Therefore, a preferred solution for this issue is a learning model which combines face-to-face approach together with e-learning model.

Keywords: Blended Learning, Learning Management, Higher Education

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Introduction

The National Educational Act (1999) states that the educational institutes and all agencies related to the educational management must encourage and support the educators to provide the atmosphere, the environment, the learning media and all the tools to facilitate the learners such that the learning can be initiated. In this regard, the educators and the learners may together learn from the learning/teaching media and all other academic resources. Therefore, the learning/teaching management needs to develop the learning/teaching format that conforms to the plan for the education development by introducing the advantage of the technology and applying it suitably. In the generation that the technology has much affected the everyday life, applying the suitable advantage of the technology in order to benefit the learning and the living is an interesting procedure, which also corresponding well with the objectives of the education reformation that wants all Thai citizen to globally have equal access to the education and is pushing for the creation of the learning society. Such purposes are considered the major key in the development of the country. The example of this development is such as the combination of “Face to Face” learning with the learning via the computer network (e-Learning). The important part of this method of learning is to apply to benefit of the computer network technology on to the course managing system such that the educators can manage, oversee and follow the learning by the learners. Such arrangement is the technology application that supports the education management.

From the condition as described above, the researchers are interested in developing the learning format that conforms to the education development plan by applying the technology to the learning/teaching. This is conducted within the course in innovation and information technology in education. The course is provided at the King Mongkut's Institute of Technology Ladkrabang Campus. In this course, the learners will know about the technology and the innovation in education, the application of technology in the education and all other new learning/teaching formats that are suitable with the present condition and also that of the coming future. This research also conforms to the objective of the institute regarding the learning/teaching management as indicated in founding manifest of the institute. For the beginning phase of the research, the researchers are to concentrate on the blended learning format as employed in Thailand. This is to identify the suitability of the research with the current state in the country and to study the learning/teaching management and the problems presently existing within the course in innovation and information technology in education that affect the blended learning and the direction for the development of the blended learning in the future.

Objectives

1. To study the condition on the research on blended learning in Thailand
2. To study the present condition on the learning management that supports the blended learning, the problems and the direction for the development of the blended learning for the course in innovation and information technology in education.

Procedure

1. Synthesize the research works on combine learning in Thailand based on the information resource which is the graduate theses published during 2006 and 2013. The number of these theses is 55.
2. Study the present learning condition that supports the combine learning/teaching, the problems and the direction for the development of the combine learning for the course on innovation and information technology for education. The study was conducted with the sample groups, which are the lecturing group; 6 lecturers for the course on innovation and information technology for education, and the student groups; 30 students from 4 programs. For the student groups, they are divided into 3 groups with purposive sampling based on their academic achievement; good, average and poor, with 10 members in each group.

Research Tools

1. Synthesizing the research, this is done by noting the characteristics which possess the advantages from the theses.
2. Conduct the interviews with the lecturers and the students. This is done with the interviewing forms. Three subjects of interests are to be raised; the present learning condition that supports the combine learning, problems and the direction of the development for the combine learning course in innovation and information technology for education.

Data Analysis

1. Two types of data are to be analyzed. One is for the general data and one is concentrated in the content of the theses. Statistical analysis tools used in describing the data are the frequency and the percentage.
2. The answers from the interviews regarding the three proposed subjects are analyzed. The relation between the data, the idea, the theory on blended learning and the thinking between the lecturers to the lecturers and between the lecturers to the students are investigated. The result from the analysis is to be used as a way to develop the blended learning.

Result from the Research

1. Synthesize the research work on blended learning in Thailand: The data used have the following characteristics.
 - 1.1 General Information: The theses being synthesized are as described below.
 1. They were published between 2006 and 2013. The years with the largest number of theses published were 2011 and 2012. In those years, 12 theses were published in each year (21.82%). The second largest, with 11 theses (20.00%), was in 2010. The year with the smallest number of theses published, 1 thesis (1.82%), was 2006.

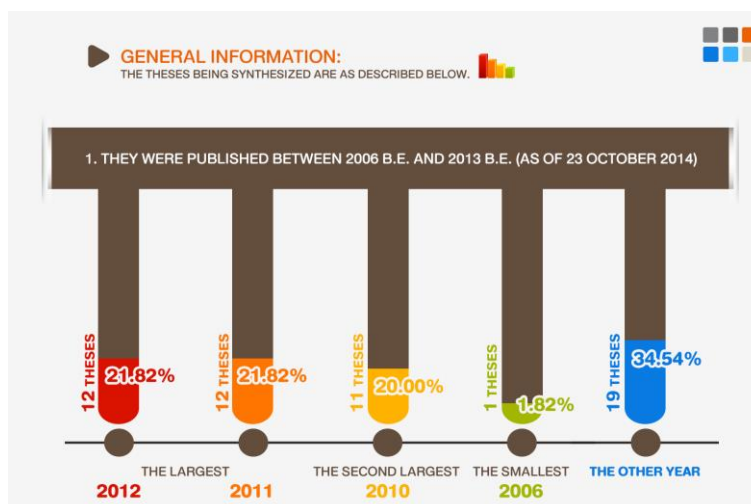


Figure 1: The year of theses published

- The theses belonged to 10 educational programs. The program that published the largest number of theses (33 theses, 60.00%) was the Education Technology Program, majored in technology and communication for education/audio-visual education. The next programs were the Computer Education Program (7 theses, 12.73%), the Science Program (5 theses, 9.09%). The other programs then contributed 10 theses or 18.18%.

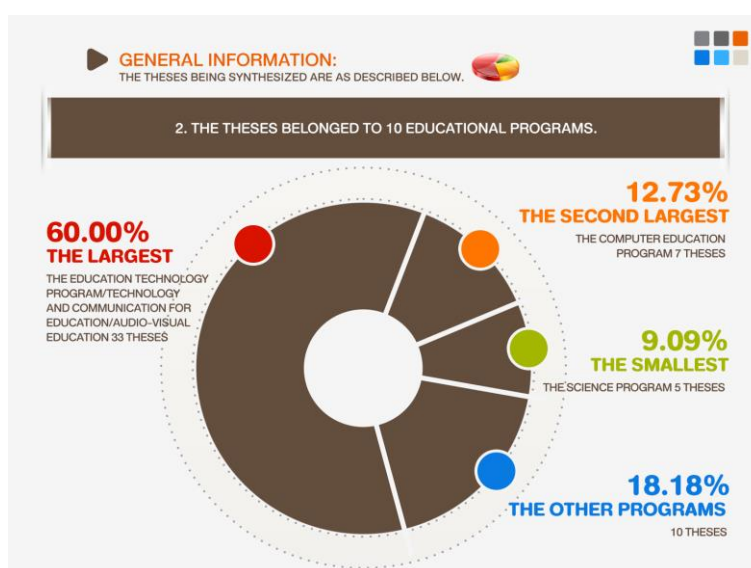


Figure 2: The program of theses published

1.2 Theses content

- Education levels of the sample groups: 6 education levels were identified. The majority was in the bachelor and the high school levels (17 theses in each level and 34 theses in total, 61.82%) the next one was at the certificate level (7 theses, 12.73%), the primary school level (6 theses, 19.01%) and the university lecturer level (4 theses, 7.27%). In addition, the education personnel level also provided 4 theses (7.27%).

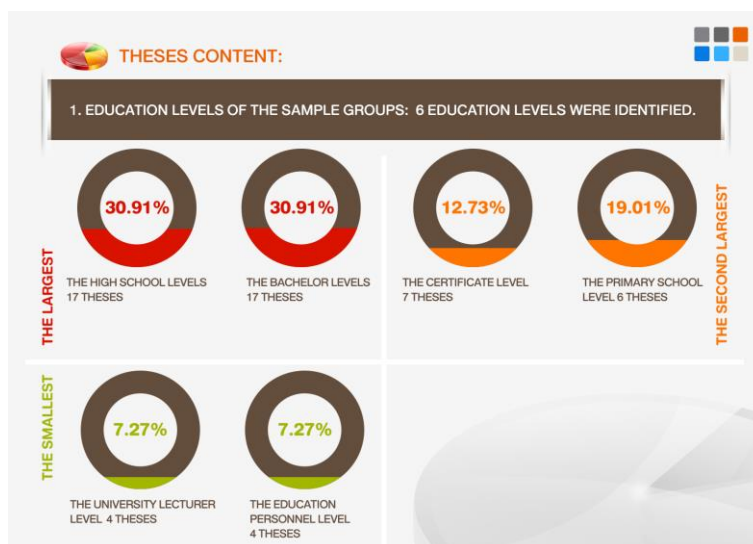


Figure 3: The majority of theses published

2. Courses that were studied: Overall 18 courses were studied. Of all the courses studied, the one on education technology was the majority (12 theses, 21.82%). The smaller groups were the courses in computer and in science (10 theses each and 20 in totals, 36.36%). The courses in sociology provided 3 theses (5.45%). The courses mathematics, special topic, physical education, electricity, Thai language and English language each provided 2 theses (12 in total, 21.82%). In addition, the other courses such graphics, music and art appreciation, etc., each provided one theses (7 in total, 12.73%).

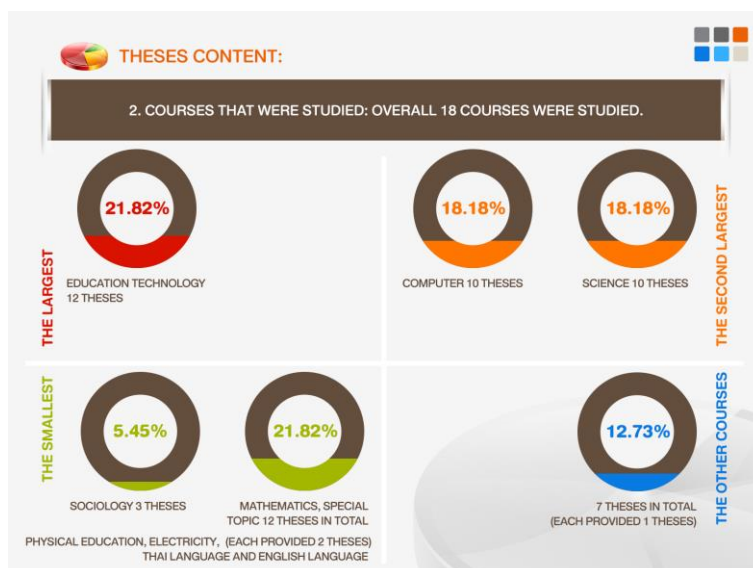


Figure 4: The course of theses published

3. Combining method: 7 methods were found to be most common The majority is the traditional learning, “Face to Face,” combined with the computer networked learning, “e-Learning.” 39 theses (70.91%) were found for this method. The next ones are the traditional learning with the

computer aided instruction (CAI) and the traditional learning with the multiple techniques for learning. 4 theses were found for each method (8 in total, 14.55%). The traditional learning combined with the on-line social media and traditional learning with the cooperative combination each provided 3 theses (6 in total, 10.91%). The least found methods were the traditional learning with the investigative technique and the traditional learning with the participation technique provided 1 thesis each (2 in total, 7.72%).

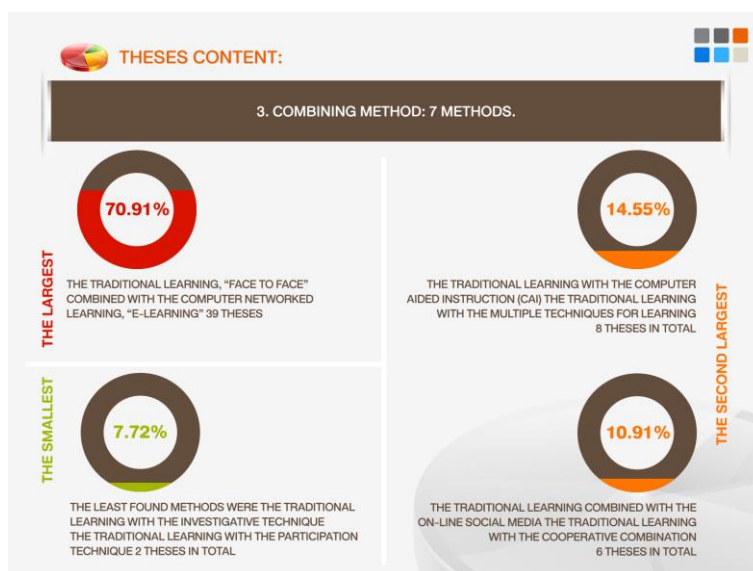


Figure 5: The Combining method of theses published

The summary of the synthesis in the research work on the blended learning in Thailand shows that the research on the blended learning was mostly conducted in year 2011 and 2012. The program in the education technology was most active in this research on the blended learning. The majority of the sample groups were those at the bachelor and the high school levels. The research was also concentrated mostly in the education technology and the method mostly employed in the blended learning was the traditional learning (face to Face) combined with the computer networked learning (e-Learning).

2. The study on the present condition of the learning management that supports the blended learning, problems and the way to develop the blended learning for the course in innovation and information technology for education: The summary is described below.

1. Data obtained from the lecturers

With the information collected from 6 lecturers, the following 3 items were identified as described below.

Item 1: Present condition of the learning management

For the course in innovation and information technology for education, the present condition that supports the blended learning can be divided into 5 subjects.

1.1 Learning method

At the present time, all 6 lecturers provide the lecture in the class. This is the traditional method (Face to Face) where the lecturer interacts in person the students. However, many years ago, one of the lecturers used to provide the lecture together with the e-Learning. However, as the server has been out of operation, e-Learning is no longer provided.

1.2 Self-learning

Each of the lecturers employs the different techniques for this purpose. One lecturer uses the problem based learning technique. The students are assigned a project so that they can solve the problem and, thus, learn by themselves in the process. The lecturer's duty is to provide consultation and guidance. The students then must explain what they have done for the project. The other 3 lecturers prefer the students to prepare the reports, mostly in group, before making presentation in front of the class. This is to train the students on how to work, learn and exchange cooperatively.

The other 2 lecturer employ the method similar to the above lecturers but the students are also assigned to conduct e-learning by visiting other websites that provide the contents related to the course. In addition, one lecturer also assigns the students to learn from the other external information sources.

1.3 Cooperative Education Environment

All lecturers arranged the class in the cooperative environment between the students and the lecturers and between the students and the students. This includes the communication via the electronic means such as the electronic mail, social media (facebook, LINE application) in order to make contact and acquire the information from the lecturers and other students.

In addition, some other lecturers also provide the cooperative environment in many other forms as described below.

One lecturer creates his own website in which the information is collected. Instagram is also used as a way to distribute the information and for submitting the assignments. The lecturer explains that such many channels are created to match the students' individuality and preferences.

Two lecturers employ the social learning websites as the ways to collect the class materials and for the students to submit the assignments, to distribute the information and to interact with the other students inside and outside of the class.

One other lecturer uses the social learning website from abroad called EDMODO.

The last lecturer employs the social learning website in Thailand provided by the Burapa University called "Class Start."

1.4 Assessment and Evaluation on the Learners

All lecturers assess and evaluate the students by conducting the midterm examination, the final examination and the class participations and activities; such as question answering, report preparation, project

preparation and class presentation, for the purpose of accumulating the points during the semester. One lecturer also evaluates the students by grading their lecture notes in order to gauge their class attentions.

1.5 Class Media, Materials and Equipment

All lecturers employ the following items to support the learning in their classes.

1. Printed materials such as learning supported documents
2. Multimedia materials such as slides, presentation (Microsoft's Power Point, etc.) and electronic books
3. VIDEO clips as collected from You Tube and other video clips Uploaded/exchanged websites
4. Articles from database and related websites
5. Information technology equipment such as desktop computers, notebook computers, tablet computers and smartphones
6. Diagrams
7. Models

One lecturer, not only experienced with teaching, also learns and employs in his teaching the advance media such as the "Augmented Reality (AR)," which is the technology that simulates the real word environment.

In addition, the university also provides the "Smart Classroom," which the classroom with the equipment supporting the teaching/ learning such as the touch sensitive devices screens and tablet computers (iPad). Some lecturers have been using this room for the class.

Item 2: Present problems on learning management

For the course in innovation and information technology for education, two problems are identified.

2.1 On the students; contents and learning management

3 lecturers agreed that the students in the different group/program had the different learning ability and the lecturers needed to adjust their methods accordingly based on their own experiences. One of them added "The problem is how to make the content more interesting and suitable to the course. This includes the activity in class, questions and answers and class exercises. This is because some students prefer the actual practice, thinking and analysis more than just only listening to the lecture.

2.2 Room arrangement

3 lecturers share the opinion that the regular classroom, if not the smart classroom, is not suitable for the students and the course. This is because such room lacks the equipment for the class. The seat arrangement, desks and chairs filled the room in rows and columns, makes the rooms to feel narrow and uncomfortable. Also, with the difficulty in the re-arranging the seats, it is sometimes not suitable for some class activity.

Item 3: Ways for improvement on blended learning

For the course in innovation and information technology for education, 3 items are considered.

3.1 Opinions on improvement for blended learning

All lecturers agree with the development on the blended learning in which the learning is the combination between the class lecturing and the e-Learning in order to increase the learning/teaching efficiency with the usage of the technology. One lecturer said “In the future, e-Learning may be made as the additional media, together with the exercises and online examination. Still, 100% online is not recommended since there is still a need to meet with the students. The blended learning is good, agreed, and should be implemented because there is no escape from the technology. Teaching in class only will not be possible. The real learning requires the usage of the technology to gain the full benefit. 100% implementation in one aspect only is not recommended. However, what is the actual fraction still needs to be discussed. A balance must be achieved based on the lecturer’s consideration.” Meanwhile, the other lecturer is in the process of creating an e-Learning system based on Moodle and expects it to be used in the next semester. Such system allows the learners to study its theoretical content by him and then finish the exercise at the end of the session. This is the same as the blended learning.

3.2 Preparing e-Learning

All lecturers agree in making the e-Learning materials. Two of them already supported the idea as stated in 3.1. One lecturer already prepared the e-Learning materials but has never applied it as a learning management system. The other lecturers already planned to implement it.

2. Data obtained from the students

The researcher summarizes the data obtained from 30 students and identifies this into 3 items as follow.

Item 1: Present condition of the learning management

For the course in innovation and information technology for education, the present condition that supports the blended learning can be divided into 5 subjects.

1.1 Learning method

All students answer that the lecturers all implemented the class in the traditional format, face to face between the lecturer and the students.

1.2 Self-learning

All students answer that the lecturers all allowed the students to study by themselves by preparing the reports and conducting the projects, by studying and conducting the research through all sources of information, from the internet via the websites related to the course recommended by

the lecturers and from the class materials of various forms prepared and kept at the websites set up by the lecturers.

Since the course is taught by many lecturers, the students may be taught by the different lecturers. Some students mention that “The lecturer told them to study from the external resources so that students can learn how to present a story with the new technique and the new technology. This is how the technology is applied to the education.”

1.3 Cooperative Education Environment

The answers obtained from the students are similar. However, the students from two different programs show some differences. In effect, the lecturers employ the electronic mails and the social media such as facebook and LINE application as the means for communication. The students from one program add that “A lecturer uses a website, which is similar to facebook, called EDMODO for the students to submit their works, to inform about the submission and to collect the class materials.” The students from the other program mention that “In their own program, the lecturer also implements the similar social media called Class Start, which belongs to Burapa University.”

1.4 Assessment and Evaluation on the Learners

All students answer that the lecturers conduct the midterm and the final examinations with the paper based testing, in addition to the evaluation via reports and projects.

1.5 Class Media, Materials and Equipment

In all programs, the lecturers employ the similar tools.

1. Multimedia such as the slides, the presentation via Microsoft's PowerPoint and the electronic books
2. Video media such as video clips from you tube
3. Computer tools such as the computer aided instruction (CAI)
4. Model
5. Printed materials such as books and handouts made by the lecturers for the course

The students from two programs also mention EDMODO and Class Start.

Item 2: Present problems on learning management

For the course in innovation and information technology for education, three problems are identified.

2.1 Contents

The students from two programs mention that the lecture is too detailed and contains too many theories. In addition, the students from two different programs also mention that the writing in the presentation provided by the lecturers is too crowded.

2.2 Class management

The students in one program add that “The learning/teaching management is the same in every course. There should be the video

records and the practice. The on-line materials are acceptable. In any case, the ability to answer the questions is most necessary. This is so that if something is not clearly understood, the question can be immediately asked.”

2.3 Lecturers

The students in one program mention “In many occasions, the lecturers cannot come to class due to other appointments. As a result, the time the students see the lecturers is reduced. This may lead to the inability of the lecturers to provide the sufficient education.”

Item 3: Ways for improvement on blended learning

For the course in innovation and information technology for education, 3 items are considered.

3.1 Opinions on improvement for blended learning

All students are interested in, agree with and share the same opinion on the improvement over the new teaching format where, in excess of the traditional lecture, the on-line materials and the exercise are also provided. The students in one program also add “The learning in this format can also help the lecturers. If the lecturers are not available, the students can learn by themselves via the on-line materials and can also practice with the provided exercise in order to revise their knowledge.”

3.2 Preparing e-Learning

The students all agree that there should be more visual contents, less text, more colorful presentation, more videos, more exercises and the ability to communicate between the students and the lecturers.

Discussion on the result

1. Synthesize the research work on blended learning in Thailand:

From the synthesis, the trend in the research regarding the blended learning is most apparent during the last 2-3 years. This may be caused by the learning/teaching pattern began in 2011. The most active program is the one in the education technology. This is perhaps due to the fact that the education technology program is the one that needs to know about the education formats which require the technology to support their managements. The largest sample groups are those of the high school and the bachelor levels. This corresponds to the comment made by Johnson, McHugo & Hall, 2006. The comment states that the blended learning is most suitable for the learners of the current generation (Millennial Generation, M Generation). The ages of the population in this M generation are between 18 and 24 years old. They are also very familiar with the technology. On the courses researched, the one that studies the most is the course in education technology. This is because blended learning puts the traditional class lecturing (Face to Face) together with the other learning formats, which mostly require implementing the technology. For example, the e-Learning materials, the computer aided instruction (CAI) and social media are used in synthesizing the theses. Of all these examples, the e-Learning is most frequently implemented. During the recent years, many academic institutes and

business entities have increasingly introduced the systems with e-Learning. This is due to its advantage that the learning can be conducted anywhere and at any time. This is the new dimension for the education in the evolving world that fulfills the traditional learning and then makes it more efficient.

2. From the study on the present learning management condition which supports the blended learning:

The problems and the way to develop the blended learning for the course in Innovation and Information Technology in Education, the lecturers and the students all gives the similar answers for each subjects and each question. The detail is as follow:

1. The research is conducted over 5 subjects: learning management, self-study encouragement, environment for cooperative learning, assessment and evaluation of the learners and the usage of various media, materials and equipment to support the learning. This is conducted according to the theory on the factors incorporating the blended learning by Carman (2006)

- 1.1 On the learning management, the present learning/teaching employed for the course in the innovation and the information technology in education is mainly that of the traditional lecture. This is the method in which the lecturers come and meet with the students. It is noted that for the blended learning, the presence of the live event is also a factor.

- 1.2 On self-study encouragement, each of the lecturers employs the different technique to encourage the students in conducting self-study. The techniques such as the project base learning and the report preparation help the students to conduct their own searches for information. This also includes the study on e-Learning from the related websites.

- 1.3 On the environment for the cooperative learning, the lecturers communicate via many channels. These channels such as the electronic mail, the social media, the LINE application and the websites allow the learners and the lecturers to communicate and share the learning.

- 1.4 On the assessment and the evaluation of the learners, these were done according to the institute's regulation which comprises of the midterm examination, the final examination, the class participation and the activity conducted by the students.

- 1.5 On the usage of various media, materials and equipment to support the learning, the lecturers employ similar media, materials and equipment. They are the printed media, the multimedia, visual media, articles from the database and the websites, IT equipment, diagrams and models. Some other additional materials are the actual items, computer aided instruction (CAI) and the AR (Augmented Reality) media.

2. Present problems regarding teaching/learning management according to the lectures and the students 3 items are summarized by the researcher as described below.
 - 2.1 About the learners, from the lecturers' point of view, the lecturers have tried adjusting their teaching methods, their presentations of the contents and their teaching/learning managements in order to make it more interesting and suitable to the learners since the learners from the different groups/programs have the different learning abilities. On the learners' side, their opinions seem to correspond with that of the lecturers in that they also want the lecturers to adjust their presenting methods, their lectures and their learning formats. The on-line format is suggested in this regard.
 - 2.2 About the class room, the present management is not quite suitable for the learners and for the course. This includes the seat arrangement and the lack of the equipment in the normal class rooms.
 - 2.3 About the instructors, the students feel concern that the lecturers may not be able to lead the class due to the other appointment.
3. The improvement on the blended learning for the course in the innovation and the information technology in education 3 items are identified as below
 - 3.1 Regarding the opinion on the development of the blended learning, both the lecturers and the students share the same opinion that they agree with the development and see that it is very interesting and may be used to solve the problems experienced by the learners such as the presentation of the contents and the teaching/learning management and by the lecturers such as the ability to change the teaching method and the contents in order to match the interest of the learners. In this regard, the learners also are pleased since they would also like the lecturers to change themselves, just as mentioned previously in the above sections.
 - 3.2 Regarding the preparation of e-Learning materials, the lecturers agree with the idea as it can increase the efficiency in teaching/learning with the help from the technology. From the students' side, they suggest that more visual content should be used with less text. The presentation should also be more colorful. The video contents and the exercises should be included and the ability to communicate between the students and the lecturers should be utilized.

Recommendations

1. From the synthesis blended learning style can be research because mostly this research is appear during the last 2-3 years. The Education Technology is the most active subject for research and the study group that appropriate can be the bachelor or the high school level because it is the level that the researcher uses the most. And the most popular blended style is Face to Face blended with the e-Learning.

2. From the study on the present learning management condition which supports the blended learning, the problems and the way to develop the blended learning found out that the management for blended learning can be implementing in Innovation and Information Technology in Education course because the result of the study for learning style provide for blended learning and draft for preliminary model with the framework in details for conclusion.

Conclusion

From the results of the study, researcher has drafting preliminary Blended Learning Model in accordance with the framework achieved by having studied on learning management conditions and problems to improve blended learning model of Information Innovation and Technology in Education Course and from having studied theories, principles, researches and related documents on blended learning.

Researcher developed two components for Blended Learning Model by Self-Directed Learning through Social Learning Network of Undergraduate Students which are blending and learning system management, see Figure 6

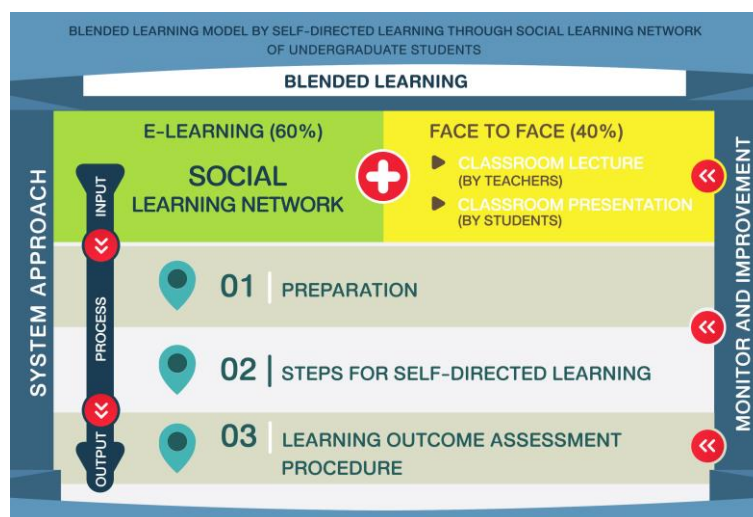


Figure 6: Blended Learning Model by Self-Directed Learning through Social Learning Network of Undergraduate Students

1. Blending

1.1 Blending between e-Learning and face-to-face Learning

1.2 Blended Learning Ratio

1.2.1 60:40 Ratio - 60% of e-Learning and 40% of face-to-face learning

1.2.2 Blending Model - Vertical Blended Learning which means coherence of e-Learning and face-to-face learning in terms of time and learning plan.

2. Learning System Management

The 4 elements partaking in applying technology to learning plan are Input, Process, Output and Monitoring and Improvement. Each element has its relation in their performance as follows.

1. Input
 - 1.1 Input for online learning: Social Learning Network
 - 1.2 Input for face-to-face learning
 - Classroom lecture (by teachers)
 - Classroom presentation (by students)
2. Process consists of three steps as follows:
 1. Preparation
 2. Steps for Self-Directed Learning
 3. Learning Outcome Assessment Procedure
3. Output meaning learning achievement and information literacy
4. Monitoring and Improvement of every learning system management's element

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*A Study of Problem of Learning Photography for Communication Module
to Develop the Patterns of Teaching Through a Virtual Classroom*

Rojana Phungsuk, King Mongkut's Institute of Technology Ladkrabang, Thailand
Chantana Viriyavejakul, King Mongkut's Institute of Technology Ladkrabang, Thailand
Thanin Ratanaolarn, King Mongkut's Institute of Technology Ladkrabang, Thailand

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Abstract

This study is one of the objectives of the research project on “The development of problem based learning model via virtual classroom” The results show that 1) the present condition supports the virtual class room learning/teaching for the photography for communication arts course. The computer laboratory is adequate for the learning/teaching in such manner. The students themselves have the computer usage skill and are able to access the data on the internet. 2) On the problem regarding learning/teaching management, Instructors still lacking of the effective teaching materials. On the grading and the evaluation, since each student posses the different level of basic background knowledge and that each course section contains the very large number of students, the students may not receive full attention from the instructors. Therefore, when the students have the problems and that the questions are raised in class, the immediate responses may not be possible. 3) On the guideline for developing the learning/teaching method, creating the teaching media for the virtual class room. This creates a content that is more interesting and allows the students to learn better. The virtual class room also carries the learning resource in photography for the students to conduct their own research. Its system allows the communication, in the form of text message, pictures, video conference, between the students and the instructors. With the tracking function, class participation can be checked and all activities can be conducted. Overall, the virtual class room emphasizes on the students' learning

Keywords: problem based learning, virtual classroom

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Introduction

With the evolvement of the education system, the task of the instructors has been changed from giving the lecture at the front of the class to that of introducing the course, guides, advices and helps the students in solving the problems. Many teaching techniques have been developed. Particularly, the computers have been used in learning/teaching. With the internet, the students now are able to communicate and exchange their knowledge and understanding between each other and with the instructors without having to stay in the class. Therefore, the learning/teaching has become more personal where one student can also make suggestion regarding the course. With the ability to use the resource commonly for the benefit of the students, sharing the knowledge and experience between the students is then possible. Managing the education then must follow the principle that the students can learn and improve themselves and that, in learning/teaching management, the achievement in learning of a student is the first priority.

The researcher is interested in developing the teaching media to support the learning in the communication arts photography course where the learners can learn and interact according to the happening situation. The various forms of the media such as the text messages, pictures, voice, motion pictures, three-dimensional simulations are to be used. In addition, the evaluation system and the knowledge resources related to the course are also implemented. The above specification describes the “Virtual Classroom,” which is the learning/teaching method that simulate the reality, to be used in the photography for communication arts course at the Faculty of Communication Arts, Kasem bundit University. Regarding the course, its content is about the principal of photography as a way to communicate the meaning between the originator and the receiver so that the objective of the photography is clearly delivered. To accomplish this target; the suitable photography devices, the principle and technique for taking the photographs, photograph composition and type of photography are the necessary knowledge. What is missing is the teaching media that remedies the problems exist in the present day learning/teaching.

For the research at the primary stage, the study on the learning/teaching condition that supports the education with the virtual class room together with the possible problems is conducted. In addition, the study on the guideline for the learning/teaching for the photography for communication arts course is also conducted. The result is then used to develop and improve the “Virtual Class Room,” which is the teaching media that allows the learning/teaching to match up with the changing traned and the development in information technology. This creates the pattern and the system for which the learning has no boundary and that the different means of communication can be mixed in the form of the multimedia to be used for learning/teaching. Not only this will reduce the long term cost, it provides the way for developing the learning basis and further expands the learning society. It increases the motivation since the students feel that they are part of the learning process and not just the receiving end from the instructors. Designing the “virtual class room” is to create the learning/teaching condition that imitates the actual class room where the students can use various part of it just as in the real class room. The students can exchange their knowledge and experience and present their information as obtained from their search through the network. It allows the students to attend class according to the schedule or to begin the class at their own time. With the voice and visual media, the students

can attend the group activity, fully interact, debate and exchange opinion with the instructors and the follow students (just like in the regular chat room). For the instructors, they can install the program to track the development and evaluate the learning and the effectiveness of the course. The “virtual class room” is an innovation that helps reduce the limits in many aspects of the education. The learners can learn at they like and at their own readiness in time, places and abilities. The “virtual class room” can be arranged in and out of a conventional school or even as a leisurely learning. This effectively leads the majority of the people to be able to learn for their whole life.

Questions used in Research

1. The opinions of the instructors and the students regarding the present condition which supports the learning/teaching in the ‘virtual class room’ for the photography for communication arts course at the Faculty of Communication Arts, Kasem bundit University.

2. The opinions of the instructors and the students regarding the problems in the management of the learning/teaching in the ‘virtual class room’ for the photography for communication arts course at the Faculty of Communication Arts, Kasem bundit University

3. The opinions of the instructors and the students regarding the way to improve the learning/teaching in the ‘virtual class room’ for the photography for communication arts course at the Faculty of Communication Arts, Kasem bundit University.

Objectives of the Study

The objectives are to study the present condition which supports the learning/teaching, the problems and the way to develop the learning/teaching in the ‘virtual class room’ for the photography for communication arts course at the Faculty of Communication Arts, Kasem bundit University.

Method of Study

This study is the qualitative research in a form of group interview. The samples are 4 instructors for Photography For Communication Arts course with at least 3 years in their teaching and 12 students at the junior level that had taken Photography For Communication Arts course. For the students, they are divided into 4 groups and are also classified based on their academic records as “good”, “average” and “poor.”

Parameters for Study

The present condition which supports the learning/teaching, the problems and the way to develop the learning/teaching in the ‘virtual class room’ for the Photography For Communication Arts course to be used as the guideline to develop the “virtual class room”

Tool for Research

1. Individual interviewing for instructors in the Photography For Communication Arts course form regarding the present condition which supports the learning/teaching, the problems and the way to develop the learning/teaching in the ‘virtual class room’ for the Photography For Communication Arts course to be used as the guideline to develop the “virtual class room” which is created from the study documents and the research works related to “virtual class room.”

2. Individual interviewing for student form regarding the present condition which supports the learning/teaching, the problems and the way to develop the learning/teaching in the ‘virtual class room’ for the Photography For Communication Arts course to be used as the guideline to develop the “virtual class room” which is created from the study documents and the research works related to “virtual class room.”

The interviewing forms for the group and for the individual are for the instructors in the Photography For Communication Arts course and for the students who had taken Photography For Communication Arts course at the Faculty of Communication Arts, Kasem bundit University.

Data Collecting Procedure

The researcher collects the data with the following procedure. Study the documents and the research works related to the “virtual class room.”

1. Conduct the interview. The samples chosen for the group interview are 4 instructors in the Photography For Communication Arts course at the Faculty of Communication Arts, Kasem bundit University. The questions are structured for the group discussion on the present condition which supports the learning/teaching, the problems and the way to develop the learning/teaching in the ‘virtual class room’ for the Photography For Communication Arts course.

2. Conduct the interview. The samples chosen for the interview are 12 bachelor degree students, Kasem bundit University, who had taken the Photography For Communication Arts course. The interview includes the questions on the present condition which supports the learning/teaching, the problems and the way to develop the learning/teaching in the ‘virtual class room’ for the Photography For Communication Arts course.

3. With the data already collected, the researcher will use the data, obtained from the group interview with the instructors in the Photography For Communication Arts course at the Faculty of Communication Arts, Kasem bundit University and from the interview with the bachelor students, Kasem bundit University, who had taken who had taken Photography For Communication Arts course, to process and identify and then perform the analysis, summary, discussion and presentation so that the useful information can be used for further research.

Data Analysis

This study concentrates on studying the study the present condition which supports the learning/teaching, the problems and the way to develop the learning/teaching in the ‘virtual class room’ for the Photography For Communication Arts course to be used as a guideline for the development of the “virtual class room” for the Photography For Communication Arts course at the Faculty of Communication Arts, Kasem bundit University. By analyzing the data from the group discussion and the individual interview according to the objectives of the study, the results regarding the present condition that supports the learning/teaching, the problems and the way to develop the learning/teaching in the ‘virtual class room’ for the Photography For Communication Arts course will be used for the development of the “virtual class room.”

Results from the Study

The summary for the results obtained from the study the present condition which supports the learning/teaching, the problems and the way to develop the learning/teaching in the ‘virtual class room’ for the Photography For Communication Arts course is as described below.

Present Condition that Supports the Learning/Teaching in Virtual Class Room according to the Instructors

Regarding the learning/teaching management, the discussion with 4 instructors yields the same information that the teaching by lecturing at the front of the class is still the preferred method. There are the presentations by the students with the computer program. In the regular class, there are also the discussions, open questions and opinion exchanges between the students and the instructors. If the learning/teaching is to use the computer technology during the course, the Faculty of Communication Arts, Kasem bundit University, already has the computer laboratory and the internet for this purpose and the students themselves are able to use the computer to access the data over the internet. Two of the instructors added that in some subjects such as the history of photography, the students are suggested to search the internet by their own via the internet from various sources such as that of e-learning. However, this is done outside the regular class. The third instructor mentions that the course also requires the students to have the field trip where the students can take the photography at the outside locations. The external speakers who are highly skilled in the different kinds of photography can also be invited for the class and that the extra activities, group or individual, can also be conducted by the students. For the communication between the students and the instructors can be done via the group-facebook, email and the telephone. For class evaluation, 2 methods are used. One is the final examination and one is the class project which is in the form of photo book.

Present Condition that Supports the Learning/Teaching in Virtual Class Room according to the Instructors

Regarding the learning/teaching management, the interview with 12 students can be concluded that while the instructors are knowledgeable and can very well communicate the content, they still lack the teaching technique that stimulate the

interest. Most of the instructors prefer the lecturing. According to Vichit Suratrungchai et al (2548-2549:116) who had studied the students and the graduate students at the Faculty of Education, Chulalongkorn University, the factor that help the students in accomplishing success in their study the most is the instructors with the next one being the students themselves. Therefore, the instructors need to listen more to the students and improve themselves. The students' opinions also corresponds to the results from the research by Vichit Suratrungchai et al (2548-2549:106) that some instructors still lack the techniques and the practicing activity while concentrate too much in lecturing and do not give clear explanation. On the students' part, they want the instructors to prepare ahead of the class and be on time. The teaching should be fun and not boring. The teaching media should be more plenty and varied. The students themselves are ready for taking the Photography For Communication Arts course via the media and the computer technology. This is because using the computer for research and making reports via the internet is very common in the nowadays life. Therefore, they do not have any problem adjusting to the learning/teaching via the media.

Problems in learning/teaching in the Photography For Communication Arts as Commented by the Instructors

At the present time, the instructors have so many responsibilities. With all the research works, the learning/teaching supporting activities and the quality assurance function, the time allowed for preparing for the class and the actual class hours are reduced. Consequentially, the content of the class may not be fully delivered and the students must study the teaching materials by themselves at their place. The content itself can also be out of date and behind the current social trend since the instructors do not have time to learn the new knowledge. For the Photography For Communication Arts course, the only media available at the current time are the power point presentation which is just a collection of still pictures, the video clips from the internet and some other equipment for general photography. These media cannot present the content with so many varieties and cannot interact individually with the students. In addition, many students also do not have the necessary equipments needed for the class such as the camera. Therefore, they may not have enough practice and may have some difficulty in using the equipments. The instructors need the more advance learning/teaching media that can remedy the said problems. Through this media, the instructors can create and change the contents by themselves. The media should also support many types of information such as the text messages, the pictures, the VIDEO clips and even that of infographics, which is presently the famous one. This kind of media helps create the students' interest and understanding in the course. Each of the instructors of the course can share their experiences, their knowledge and their source regarding the photography so that the students can do the search by themselves. At the present time, this is done by sharing the related links in the group-facebook where only a handful of students read. In fact. Most of the instructors suggest that facebook is just a helper for the communication purpose. For the required media, it must have the system that can manage the content and track the students' performance with the efficient communication system. It must be able to communicate by visual and by voice, conduct teleconference via the internet, share the knowledge in a group and must be easy to access from anywhere. It must also support various kind of computers and mobile devices. This is necessary because such devices are widely used by the students. For the problem in evaluating

the students' performances, as the students have the different levels of background knowledge and since there are so many students in the class, the instructors may not be able to take care of them effectively. Therefore, the expected media must contain the part that helps the students in adjusting their basic knowledge and regularly evaluate the teaching. This is such as having the students practice taking the photographs and then allows the students to present their works in the media so that their friends, the instructors and those who are interested in photography can make comments. The results can be analyzed and the learning/teaching can be improved. There is also the system to evaluate on class participation, class assignment and work portfolio. This corresponds to the comment by Suwit Moolkam (1999, page 25) that the evaluation based on the actual result can be conducted with many methods. They are such as by the observation, by interviewing, by grading the assignments, by having the examination, by checking the reports from both the instructors and the students, by seeing the portfolio, the short notes, the appreciation notes and the notes from the instructors, students, friends and parents and by conducting the final examination. Especially, the portfolio is the information source/evidence that shows the ability, the achievement, the progress and the pride in which the instructors and the students systematically collect and present.

Problems in learning/teaching in the Photography For Communication Arts as Commented by the Students

During the practicing period of the class, the problems that occurs or the questions that are raised cannot be forwarded immediately to the instructors due to the large number of students attending the class, which means that there is not enough time devoted to the learning/teaching. Even though there is a communication channel via facebook that allows the students to post the questions or problems regarding the practice in taking the photographs in the studio, there is still the problem about the lack of equipments for the learning. This is such as the adjusting lights and the light meters that the studio carries only the small number and, therefore, there are not enough of them for the practice. This causes some students to have less skilled in this field. If there is the tools such as the teaching media, the severity of this problem can be reduced. For example, the three-dimensional modeled images or the video clips demonstrating the usage of various equipments which can be retrieved for learning at any time will be useful for this purpose. For the performance evaluation, the students may have the very different levels of the basic knowledge. That is some of them may already have learned how to take the photographs such that they can better learn and understand the course better than those who have not. Therefore, it is recommended that there should be the teaching media that help improve the basic knowledge before the actual class. For the submission of the assignments, the instructors require the students to submit their by reproducing/enlarging the photographs. This means an expense which can be cumbersome to the students who lack the monetary supports. Therefore, it is recommended that it should be possible to submit the work as an electronic file to the system so that the instructors can look up, comment and provide the grade.

Guideline for the Development of the Learning/Teaching

1. In using the teaching media in the form of the "virtual class room" for the Photography For Communication Arts course in which various means of

communications are put together as the multimedia so that the content is more interesting and that the students can learn the material better, the learner should be able to use the media to adjust their basic knowledge. The media should also provide the activity that encourage the students to learn by themselves and should also provide the knowledge resources regarding the photography so that the students can conduct their own research. It also has the communication system that can communicate with the text messages, the VIDEO conference between the students and the instructors or between the students themselves. The tracking system for class attending and other activity participation are also necessary.

2. The media must emphasize more on the leaning by the students and less on the teaching. It reduces the teaching duty of the instructors and encourage the students to initiate their learning as stated in the idea of “Teach Less, Learn More.” This is to let the students know how to learn by themselves by accessing various sources of information. This also corresponds to the idea given by Tisna Kaemmanee (1999, page 25) which states that the learners are the most important part. The heart of the revolution on the education is to stimulate everyone to participate in the management of the education, to let them recheck and refine their thinking, their belief and their practice and to be aware of their new duty and responsibility in managing the learning in order to support, create and develop the learners so that they possess the quality expected by the society.

Suggestion

1. The result from the study found that the problems in learning/teaching in the Photography For Communication Arts course due to the learning/teaching itself is the lack of the teaching media that is stimulating for the learners. It is necessary to conduct the research to develop the learning/teaching media for the course.

2. There should be a research on the basic knowledge that is lacking by the students. This will be beneficial for the efficient learning/teaching.

3. There should be an according research where the students are divided according to their learning ability. The result can then be analyzed according to these groups. The opinion of the students from the groups with various abilities in learning can also be compared.

4. There should be a comparative study on various type of teach media so that the teaching media most suitable for the Photography For Communication Arts course can be identified.

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The Development Gamification on the Concepts Teach Less Learn More for Vocational Education

Pratanporn Ounor, King Mongkut's Institute of Technology Ladkrabang, Thailand
Chantana Viriyavejakul, King Mongkut's Institute of Technology Ladkrabang,
Thailand

Somkiat Tuntiwongwanich, King Mongkut's Institute of Technology Ladkrabang,
Thailand

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Abstract

This research To study the components of the development the gamification on the concepts Teach Less Learn More for learning in vocational education. This study was a qualitative research. Using data were collected by interview. Semi-structured Technique of a Focus group discussion. from the experts 9. 7 male, 2 female expert at Game 2 of the media and technology education, 2 people, moral three people and professionals to promote moral ethics to students 2 analysis. to find an element in the development of gamification by finding the IOC of the elements of 4 main components can be divided into 21 sub-elements. And interviews On the practice of formatted according to the Teach Less Learn More.

The results showed that the elements in the development of vocational education students gamification fits. By the IOC 1.00 has 3 components: 1) the reinforcement of activities 2) Ratings 3) indicate the level. And the IOC 0.88 has two components: 1) prize of activity, 2) the reverse effect on learning. And the IOC 0.77 was to evaluate the behavior of the participants, included the 6 components of the interview. Found that the practice of formatted accorded to the Teach Less Learn More.: 1) the creation of self-knowledge, 2) interaction with others, 3) interaction with the environment 4) enthusiasm of learning 5) evaluation of behavioral observation.

Keywords: Gamification, Teach Less Learn More, Vocational Education

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Introduction

According to the natural statistics Bureau the amount of students registered in the system of vocational education there are 684,760 students and students are not in the study, among study on the private vocational college there are 369, 622 students The government has the idea and policy to reform the educational for the second decade (2009 to 2018) which will emphasize to improve the quality , the value and vocational deviational standard since the vocational education is the main organization to produce and develop manpower in vocational field, workmanship level, technical level and technology level to be able to work in the businesses and establishments and self employed which will setup activities to develop for those who study vocational education with desirable feature which have the competency in the way of society and establishment needs if there is learning management of tech less but

- 1 Qualifications of vocational students (Anand Ngamsaad:2010)
 - 1.1 Has knowledge and ability in vocational field both in theory and practice.
 - 1.2 Has knowledge and ability in everyday daily life, such as basic computer knowledge, Thai culture, arts and literature, sports, foreign languages, skills of thinking and group process.
 - 1.3 Has knowledge and ability in management.
 - 1.4 Has morality, can live in a good society with pride.
 - 1.5 Has Thai uniqueness.
 - 1.6 Has good social values, such as has responsible, discipline, friendliness good human relations, public mind, democracy preference, team work, royalty to organization.
 - 1.7 Follow the philosophy of sufficient economy.
2. Activities to develop vocational students:
Extra Curriculum Activities, Co–Curricular Activities, Semi Curricular Activities, Extra Activities, School Activities, Group Activities and Initiate Activities, etc..
3. Guidelines for activities to develop learners:
The following guidelines should be considered:
 - 3.1 The activities that can develop the standard of vocational education and vocational long-life learning, the career standard, the basic effectiveness curriculum, the vocational speciality, communication, IT language, the analysis thinking and career skills. This is to cope with the economical competition. Learners are to have morality, public mind and emotional maturity.
 - 3.2 The activity that can develop potential of vocational learning, create vocational learning system, encourage the vocational long-life leaning.
 - 3.3 The activities that create community network in vocational knowledge.

In order to set have activities to develop vocational learners to serve the needs of the organization and society, there should be suitable methods. If the “Teach Less” method is provided, meaning more self learning, less theory teaching, focusing on practices, learners can learn happily, have fun while learning amidst the pleasant learning environment. Learners can find the learning interesting and challenging. This is to abide with the “Teach Less Learn More.” method in Singapore (Mr. Thaman Chanmugaranam Singapore ministry of Education .2005) The concept is under the

vision of Thinking, Schools, Learning, Nation (TSLN) which is aimed to change the education system to be more effective. The vision of the Thinking Schools is to allow schools to develop their schools to have Thinking student. The learning nation is the leaning vision that allow the learners to have more knowledge on innovation and creative ability in order to apply in daily life. It is the changing of the quantitative educational management to qualitative educational management which is to increase the qualitative educational management and to decrease the quantitative of the educational management. The increase of the qualitative educational management is to increase the interaction between the teachers and the learners, to allow learners to express their ideas, to encourage the lifelong learning and to use the effective teaching method so that learners can learn successfully.

The decrease of the quantitative educational management is the decrease the role of teachers to become guides, to stimulate learners to gain knowledge, changing the learning by memorizing, tests and looking for answers into playing activities that will help learners to learn, have objectives and the playing rules stimulate the fun from learning. The activities can help develop the thinking. Nowadays, techniques and technology are combined with games. New created games can be applied to daily life. The games are applied into the curriculum to make them more attractive. The games are designed so that participants can be measured and can be competitive. The games are designed for competition and participants can try to reach their goals steps by steps. This is called gamification which mean using of games and dynamic of games to create interaction of users and solve problems. Gamification is used in application and the process of improving user engagement, ROI, information quality, the on time delivery and the learning.

In Thailand, the most obvious design of gamification is to use game in marketing such as the point collection or other competition. It is quite rare in other fields which is good for a game developer and digital media such as the personnel development in an organization. The method is to have the compete the point collection in self development or taking care of your health, especially the design of e-learning which apply the game playing into the traditional online leaning. This is to develop the gamification in order to elevate the learning and develop the skills of vocational students to serve the needs of companies and the society that will join the Asean Economics Community-AEC.

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Research Objective

Objective for this research as follows

1. To study at the present and development Gamification on the concepts Teach Less Learn More For Vocational Education.
2. To study elements Gamification on the concepts Teach Less Learn More For Vocational Education.

Research Method

1. Data source is related research student to principle and concepts to development for vocational education.
 - 1.1 The elements of Gamification.
 - 1.2 The concepts Teach less learn more.

1.3 The principle and concept vocational education

1.4 Raise the moral to vocation to student.

Group discussion by 9 experts, assign the conceptual framework.

2. Informant group

Informant group is 9 experts at game 2 of the media and technology educations 2 people, moral 3 people and professionals to promote ethics to students 2 analysis.

3. Variable

3.1 The principle and concept Gamification.

3.2 The principle and concept Teach Less Learn More for learning.

3.3 The principle and concept the elements to promote ethics for vocational education

4. Tools for study

This study was a qualitative research.

4.1 Data were collected by interview. Sami-structure technique of a focus group discussion.

4.2 Evaluation form for the elements gamification on the concepts teaches less learns more for vocational education.

5. Statistical analysis

5.1 Statistics in education development gamification on the principle Teach Less Learn More for vocational education.

5.2 Index of Item objective congruence.

Method

1. Components of gamification (data from B2S Leader Marketo Increased Community:2014). Selection and divide is 4 topics, 21 elements. The theory in game is “Incentive Theory” in elements gamification.

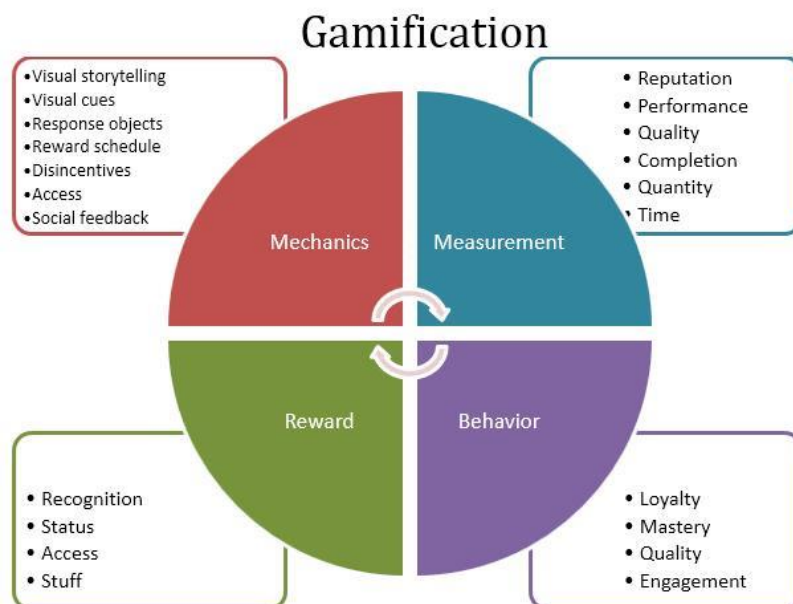


Figure 1: Elements gamification.

2. Using data interview, semi-structure of a focus group discussion from the experts' 9. 7 male, 2 females. Experts at game 2 of the media and technology education, 2 people, moral 3 people and professionals to promote moral ethics to students 2 analysis. Interview about learning activities and skills development in vocational education.
3. Conformity assessment elements as gamification from 4 topics, 21 elements to select and collect to coincide with the curriculum. Activities and promote skills development in vocational education. Performance Needs of enterprises and social on the concepts teaches less learns more.

Research Result

1. Concept teach less learn more for learning vocational education by gamification. Focus on the learner have ethics moral, have a good attitude for profession have vocation skill. A concept teaches less learns more is need to the learner study by themselves, enthusiastic. Can qualify and friendly with other people. Can evaluate from behavior correctly.
2. Rated by 9 experts. Collect the topic with leaning activities promote and develop skills of study in vocational education to performance needs of enterprises and social on the concepts teaches less learns more from 4 topics, 21 elements 6 elements. As flowing

Table 1.1 Index table showing the consistency of gamification by teach less learn more concepts.

Gamification elements For Vocational Education	IOC
Rating	1.00
Reinforcement of activities	1.00
Prize of activities	.88
Level	1.00
Reverse effect on learning	.88
Evaluation	.77

From table 1.1 IOC 1.00. 3 element is reinforcement ratings and 3 level 1. Have 3 elements is Reinforcement, Ratings, Level IOC 0.88 have 2 elements Prize of activities, Reverse effect on learning and IOC 0.77 is evaluation including with 6 elements.

Discussion

The core of gamification

1. Game mechanics are rules and responses in the games which will bring fun and can create something that is not a game into a game, such as points. Levels, score charts and the task challenge.
2. Game dynamics are human behaviours who are driven by the games which are human needs such as rewards, acceptance, success, the self expression and the competition.

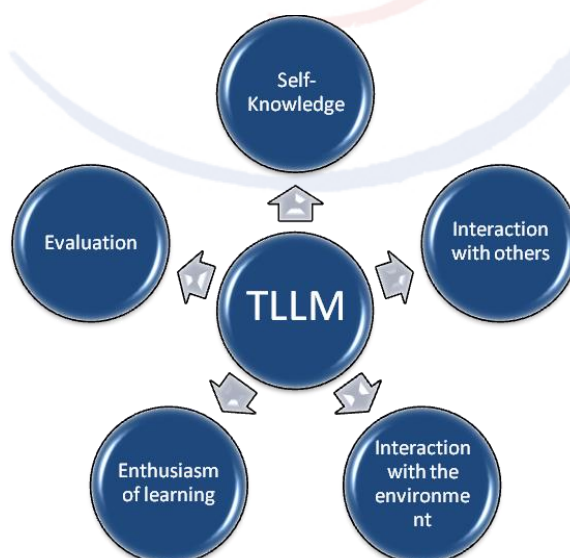


Figure 2: Teach Less Learn More element.

3. The elements of gamification to study of gamification by Teach less learn more concepts of vocational education focus on

3.1 Morality such as gratitude discipline honest tolerance sacrifice gentleman.

3.2 Skill such as information skill, have a good attitude for profession, profession skill and regulate of Teach Less Learn More concepts is Learning by self, Interaction, Interaction with the environment, Enthusiasm of learning and Evaluation.

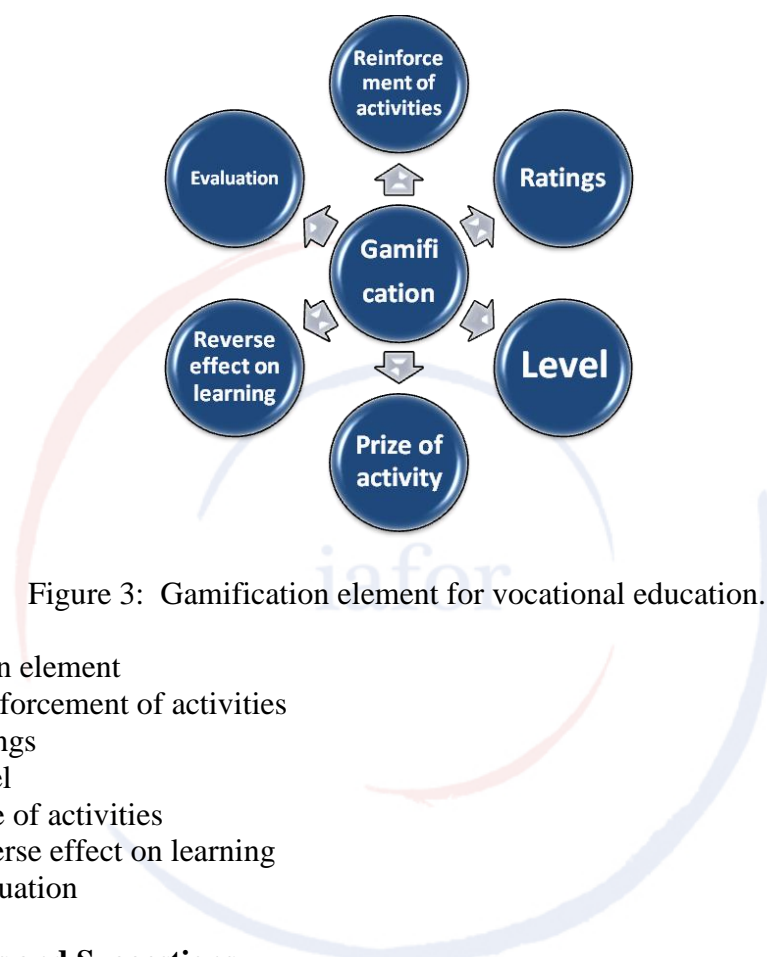


Figure 3: Gamification element for vocational education.

Gamification element

1. Reinforcement of activities
2. Ratings
3. Level
4. Prize of activities
5. Reverse effect on learning
6. Evaluation

Conclusions and Suggestions

Development gamification by teach less learn more by vocational education should to have many activities for activate student to learning such as goodness collet game moral developing game education project etc.

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An Interactive Example for Game-Based Programming Environment

Po-Yao Chao, Yuan Ze University, Taiwan
Yun-Jen Hu, Yuan Ze University, Taiwan

The Asian Conference on Technology in the Classroom 2015
Official Conference Proceedings

Abstract

Many researchers suggest that programming is beneficial to career and the development of problem solving skills. However, traditional teaching methods and learning environments for programming accentuate the difficulties of programming since they merely emphasize the syntax or features of programming language and they offer few support in acquiring programming strategies. With advance of computer games and simulation environments, game-based problem solving activities have potential in improving the competence of programming strategies by providing interactive examples. Therefore, the purpose of this paper is to incorporate features of interactive examples and game-based learning to develop a game-based learning environment for programming strategies. Learners develop their programming strategies with the help of interactive examples that guide the learners with procedures of problem solving steps and ask the learners to complete partial solutions for problems. This completion task is believed to benefit the motivation and performance of developing programming strategies. The influences of the game-based learning on learner behavior, strategies, and performance are also explored in the paper.

Keyword : interactive example, game-based programming environment, programming strategies

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Introduction

With the popularity of computer and advanced information technology, learning programming has been a trend. According to the U.S.A Bureau of Labor calculated, 2010 to 2020 the number of job openings of programmer is expected to growth 30% substantially, the other job only growth 14%(Lockard & Wolf, 2012). On the other hand, since September 2014 coding has been introduced to the school timetable for every child aged 5-16 years old, making the UK the first major G20 economy in the world to implement this on a national level. According to the research, learning programming can enhance students' ability of problem solving (Baroody & Coslick, 1993). Moreover, programming is a way of thinking by using abstraction and decomposition to solve problems (Liu, Cheng, & Huang, 2011). Having the ability to programming will enhance the self-competitive (Kiczales et al., 1997). Many researchers suggest that programming is beneficial to career and the development of problem solving skills (Atkinson, Derry, Renkl, & Wortham, 2000; Renkl, 2005; Sweller & Cooper, 1985; Zhu & Simon, 1987).

Cognitive Load Theory (Sweller, 1988, 2006, 2010) suggests that learning should consider the learner's cognitive load instead of traditional teaching method which merely focus on practice. To novice, learning from examples is more effective than directly answer the question (Renkl, 2005). However, compared with nature science, which can clearly observed behavior of learning target, programming involves abstract concepts and dynamic execution processes. It is difficult to observe the sequence and status during the execution of program in the traditional learning programming environments. Making programming a visualized process will assist the description of the programming process and status (Kaila, Rajala, Laakso, & Salakoski, 2010). Research found that simulation-based learning environment can improve the ability of problem solving (Liu et al., 2011), and game-based learning can improve engagement and motivation (Perrotta, Featherstone, Aston, & Houghton, 2013). Therefore, to help learner understand abstract concepts and dynamic execution process. We develop an interactive example scaffolding based on our previous game-based programming environment, and explore the influence of this interactive example scaffolding for learners.

Game-Based Programing Environment

The game-based programing environment proposed in this paper is a simulation environment which learner's goal is to instruct a robot so that he can collect items on a farm effectively. Learners generate an instruction card containing a set of instructions to control the robot. Through solving task in the environment, learners gradually learn the programming concepts and skills. However, in this paper, we designed an interactive example mechanism which a programming problem and the corresponding sets of instructions as solution made by experts were employed to help novice programmers learn how to solve the problem by exploring the solution. The novices may examine the instructions and then observe the result of executing these instructions. They also may insert or delete instructions to test their hypotheses. To improve transfer we design tasks similar with the interactive examples to examine novices' problem solving after the novices finish the exploration of interactive examples. Learning with the interactive example mechanisms contains the following parts:

(1) Expert model

Each programming problem involved in the interactive example mechanism corresponds to a set of instructions made by programming experts. The instructions serve as expert model that train the novice programmers in terms of how to apply and implement specific programming strategies. Novice learners can carefully consider the planning of path the robot should move and review the segments of instructions generated by the experts. Through the programming executing, the novice learners observe the ways which an expert solve programming problem and consequently develop a preliminary understanding of the model.

(2) Formation of mental model

Novice learners develop their mental model by generate and test their hypotheses on the predication of the robot's actions. The learners may insert or modify instructions embedded in the interactive examples and then verify the effect of the modified instructions on the robot's reaction. Several functions enable the learners to generate and test their hypotheses. They edit the expert instructions to implement the hypotheses, which includes: modify instructions, insert instructions, copy instructions, delete instructions, and modify the instructions.

(3) Control for simulation

The simulation provides novice programmers with a continuous visual feedback. To help the learners build complete mental model, the mechanism also offers the functions to control the simulation. For example, when learners require further verification, they may set breakpoints to pause the execution of the program.

Illustration of Interactive Example

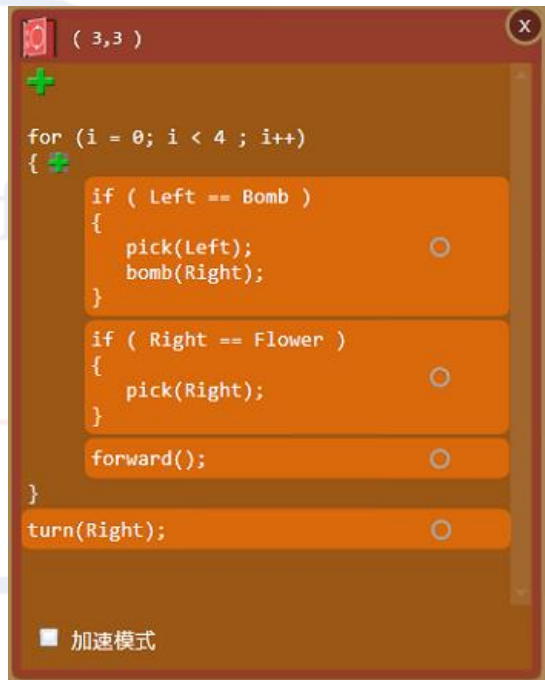
Figure 1 illustrates the use of interactive example. In this example a learner's goal is to collect all the flowers, bomb a stone and reach farmer's place. The initial state of the environment includes flowers, stones, and the places of robot and the farmer, as shown in Figure1 (a). The green path highlights the routes planned by the expert and instruction cards generate by the expert is displayed on the top left of a grid. In this example, expert set three instruction cards as the representation of corresponding solution. If a learner moves their mouse over the instruction cards, the content of that card will show next to it shown as Figure 1(b). Click the instruction card it will show the edit panel in the left side of scene shown as Figure1 (c).



(a)



(b)



(c)

Figure 1: Default environment

In this example, a learner first presses the execute button which initiates the robot to execute the instructions. The goal is to collect all of the flower and bomb a stone. An instruction card, as shown in Figure 2(a), includes a loop that repeats four times of a series of instructions. For each loop, the robot first determines whether there is a bomb on the left and then continues to determine whether there is a flower on its right. Finally the robot takes one step forward. The learner may hypothesize that the sequence of determination and the movement may make no difference in their corresponding results. As shown as Figure 2(a), the learner may try to modify the

sequence of the instruction by clicking the arrow next to the forward action to change its location as shown in Figure 2(b).

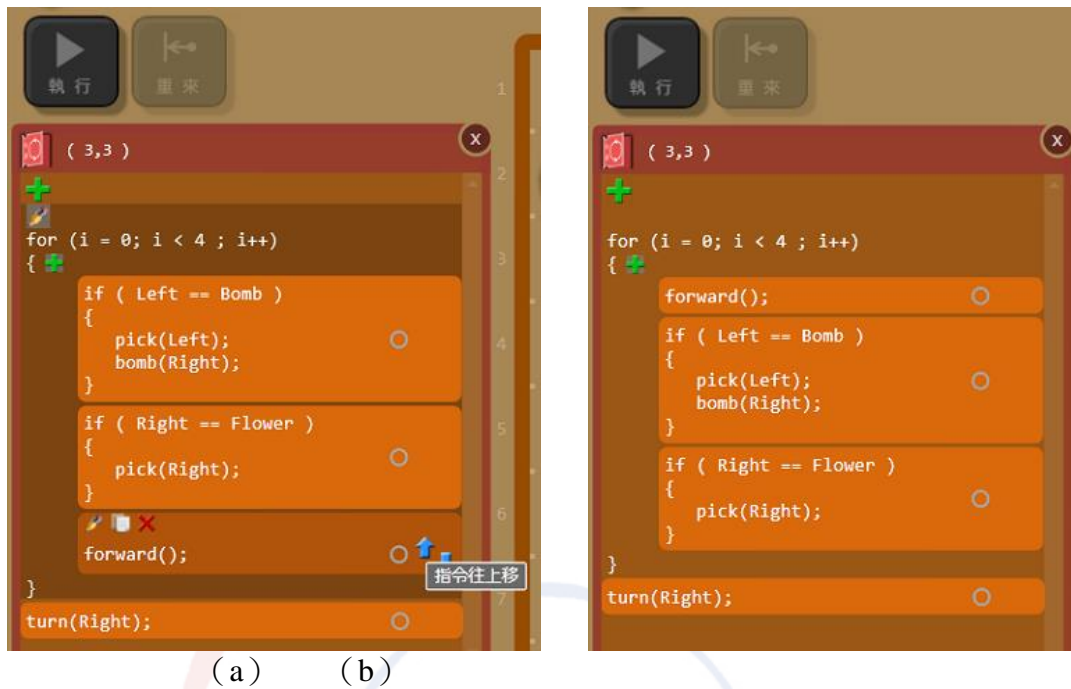


Figure 2: Move instruction

After executing the instructions contained in the Figure 2(b), the robot didn't pick a flower in coordinate (3, 4) shown in Figure 3(a). When robot reach the farmer's position, the system displayed messages indicating the failure of the program as shown in Figure 3(b). To fix the failure, the learner may observe the robot's behavior so that he can identify the problem. He set a breakpoint to purposeful pause the execution and examined the results.

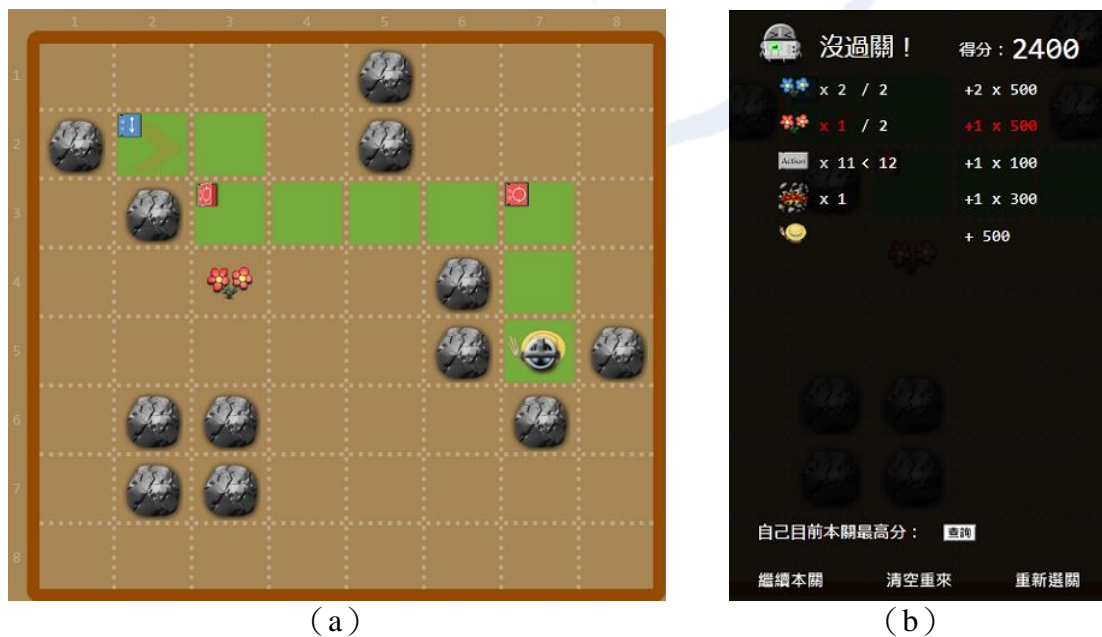


Figure 3: Executed result

Evaluation

The participants are 84 freshman of non-major students who are 19 years old. Before evaluation, they are introduced to the interactive example mechanism for two hours. The process of the evaluation, shown in Figure 4, includes practice and survey phases. During the former phase, participants were asked to explore one interactive example and solve a programming problem similar with the provided example. This phase took 60 minutes. The latter phase aimed to explore how the participants use the interactive example mechanism by briefly interviewing the participants.

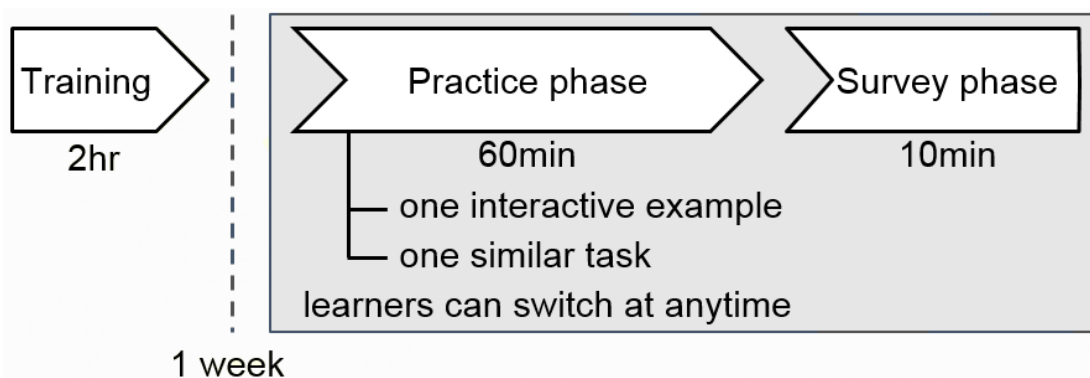


Figure 4: Process of evaluation

The preliminary result shows that 51 participants could finish the process of exploring interactive examples and solving the similar task successfully. This may suggest the interactive examples had the potential in assisting the participants solving specific programming problems by exploring corresponding interactive examples. The results of interview showed that some students think that learning programming through this game-based environment is more interesting than the conventional approach. For example, S11 said “learning programming from the game is a good way”. S25 said “It is more attractive and interesting than taking class”. With regard to the interactive example, some students think it provide guidance when they tackle with the similar tasks. For example, S13 noted “I knows how to solve the task when there is an example” and S34 considered more example can help learners reach task more successful. Some students give us useful advice, they suggest that we can give some hints to help them when they has difficulties with task. For example, S5 hope there is a hint when player spend too long to reach task. The student S6 said “I will not feel frustrated if there were a hint”.

Based on the result of the evaluation, the game-based learning environment and the proposed interactive example mechanism may help novice programmers solving programming problems and develop more complete mental model. We hope the proposed environment and mechanism can integrated into the curriculum so that novice learners can learning their programming in a more active and interesting manners.

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Contact email: poyaochao@saturn.yzu.edu.tw

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Parental Involvement in Children's Gaming and Students School Outcomes

Mido Chang, Florida International University, USA

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Abstract

Although the research on parents' involvement in their children's gaming (PMG) should be an important area of research, there is little research compiled in the field. Considering the dramatic growth of students' gaming and its negative influences on their attitudes and behaviors (Gentile, Lynch, & Linder, 2004) and academic performance (Skoric, Teo, & Neo, 2009), PMG should be examined attentively as a way to alleviate the problems caused by gaming (Nikken, & Jansz, 2006). The aim of the study is to explore the effect of PMG on school outcomes of middle school students. Our research team developed a video game and survey instruments on PMG, students' mathematics engagement, and mathematics performance through iterative validation process. The research team collected data from 403 6th, 7th, and 8th grade students in rural schools in Virginia, the United States. As for PMG, this paper included the four types of parenting behaviors of making rules for digital game playing, checking the content of digital games, guiding to choose good digital games, and playing digital games with children. The results showed that although parental involvement in children's gaming did not show significant direct effects on students' mathematics performance, it had a significant effect on mathematics engagement that made a significant effect on mathematics performance. The study findings provide practical baselines for research on parental involvement in students' gaming.

Keywords: computer games, mathematics engagement, mathematics performance, parental involvement

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Significance of the Study

The recent unprecedented growth of students' gaming has been a major concern for many teachers and parents. They worry about the influence of games on students' aggressive behaviors and academic performances in school (Anderson & Bushman, 2001). Many empirical studies indicate the negative outcomes of students' excessive gaming confirming the concerns. Gentile, Lynch, and Linder's study (2004) showed that eighth and ninth grade students who played violent games displayed frequent hostility toward teachers, aggressive arguments with teachers, and involvement in physical fights with peers. They also tended to perform poorly in school. Hastings, Karas, Winsler, Way, Madigan, and Tyler (2009) also showed that time spent playing violent games related to aggression and negatively associated with school competence of children. The authors also showed playing educational games was significantly related to positive school outcomes.

Skoric, Teo, and Neo (2009) examined the habits of gaming of elementary school students and its relationship to their academic performance in Singapore. In their study, the authors collected data on (a) amount of time spent playing video games, (b) addiction tendencies (based on Brown's dimensions of video gaming addiction criteria and questions adapted from the Diagnostic and Statistical Manual of Mental Disorders, 4th ed.), (c) engagement tendencies and (d) demographic information. The results showed that the amount of time spent playing video games on weekdays had a significant positive association with English test scores, but not with mathematics and science test scores. However, children who exhibited gaming addictive tendencies displayed significantly low test scores in the three subjects.

Several educational researchers believe that parental involvement in their children's gaming can mediate the relationship between children's gaming and their negative school behavior. Gentile, Lynch, and Linder's research (2004) showed that when parents limited violent video games of 14-year-old students, the students showed fewer fights and arguments, and comparatively high school performance. Some researchers such as Nikken and Jansz (2006) searched for effective mediation strategies by examining the parental involvement methods that parents used to regulate their children's gaming. Through an Internet survey of 536 parent-child pairs, the authors found that three types of parental involvement in children's gaming as restrictive mediation, active mediation, and co-playing. Interestingly, the three types of PSI were similar to the mediation strategies for television watching. Their results also indicated that parental mediation of gaming strongly predicted by the child's age and the parent's gaming behavior. Interestingly, parents applied more restrictive and active mediation when they predicted negative behavioral effects and more often co-played with their children when they expected positive social-emotional effects of gaming.

However, there is not enough research that has examined the effect of parental involvement in children's gaming on their children's academic engagement and performance. In this paper, our research team attempted to examine parental involvement behaviors in children's gaming by considering different types of involving behaviors. One step further, this research explored its relationship with children's engagement and performance in mathematics class.

Methods

Participants

A total of 403 middle-grade students in low-performing, rural schools that are located in southwest Virginia initially participated in this study. After screening non-responses, our team conducted the analyses for 81 sixth graders, 136 seventh graders, and 115 eighth graders. There were 156 males and 144 females, and the average age of the students was 12.31 years old.

Variables

The main endogenous (outcome) variable of the study was the pre-algebraic performance scores of students who were in sixth, seventh, and eighth grades. This study used an instrument to measure students' mathematics performance, particularly students' fraction proficiency. The mathematics performance instrument contained multiple choice questions to identify students' knowledge of understanding equivalent fractions, multiplying, dividing, and comparing fractions. The math achievement instrument contained a total of 15 questions and showed defensible reliability statistics having α value of 0.849.

To measure students' engagement levels, this study used a mathematical engagement instrument that was composed of 33 items to measure the overall math engagement with three sub-domains of engagement: behavioral, emotional, and cognitive engagement. The researchers created the items based on comprehensive literature review on existing mathematical engagement instruments. The four Likert-type scales indicated 4 for strongly disagree and 1 for strongly agree. The coefficient alpha for overall engagement was 0.89; behavioral engagement was 0.68; emotional engagement was 0.84 and; cognitive engagement was 0.79. The reliability test results at the posttest demonstrated higher internal consistency than at the pretest: overall engagement was 0.91; behavioral engagement was 0.79; emotional engagement was 0.86 and; cognitive engagement was 0.81.

The main predictor variables of the study were four types of parental involvements (PI) on their children's gaming behavior: 1) "My parents make rules on my digital game playing."; 2) "My parents check the content of my digital games."; 3) "My parents tell me which digital games are good ones."; and 4) "My parents play digital games with me." The variables were named as "Rule," "Check," "Choose," and "Play" and assigned 1 for "strongly disagree," 2 for "somewhat disagree," 3 for "somewhat agree," and 4 for "strongly agree." This study included students' gender (male = 0; female = 1) and age as covariates in an analytical model to consider the effects in the analysis.

Analysis

This research used a path model making paths students' age and gender, PI, mathematics engagement, and mathematics performance as observed variables. The study used LISREL that is the well-known software for its multiple strengths, such as dealing with non-recursive models, multi-group comparisons with a group mean centering, and tests of constraints.

Results

Preliminary Analysis

As preliminary analyses, this research first conducted descriptive statistics analyses to examine the levels of parental involvements in their children's computer games and bivariate correlations of parental involvement with the main outcome variables. To summarize the frequencies of PI on their children's gaming, more than 40 percent (from 40.3% to 50.3%) of parents in our study did not take any action and less than 18 percent (from 10.7% to 17.3%) of parents displayed active involvement for as shown in Table 1.

Table 1. Frequencies and percentages of parental involvement for children's gaming

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
My parents make rules on my digital game playing.	151 (50.3%)	69 (23.0%)	48 (16.0 %)	32 (10.7%)
My parents check the content of my digital games.	119 (40.3%)	59 (20.0%)	66 (22.4%)	51 (17.3%)
My parents tell me which digital games are good ones.	124 (42.0%)	41 (13.9%)	81 (27.5%)	49 (16.6%)
My parents play digital games with me.	124 (41.5%)	56 (23.4%)	70 (23.4%)	49 (16.4%)

The correlation analysis revealed that PI had a significant negative correlation with students' age ($r = -.159, p < 0.01$) indicating that parents involved more frequently in students' gaming for younger students than older students. PI also showed a significant positive correlation with mathematics engagement ($r = .224, p < 0.01$), indicating that more frequent parental involvement was associated with students' high mathematics engagement. PI did not show significant relationships with students' gender and mathematics performance. Mathematics engagement had a significant relationship with mathematics performance ($r = .165, p < 0.01$).

Table 2. Correlation among variables

	1.	2.	3.	4.	5.
1. age	1				
2. gender	-.033	1			
3. PI	-.159**	-.061	1		
4. Math Engagement	-.152*	.043	.224**	1	
5. Math Performance	-.420**	.066	.002	.165**	1

Note: * indicates significant at 0.05 and ** indicates significant at 0.01

Path Analysis

The path analysis results indicated a good fit of the model to the data, $\chi^2 = 1.50$, $df = 2$, $NFI = .984$, $RMSEA = .000$). The incremental fit indices of .90 or above, and an RMSEA value of .07 or less are considered adequate, suggesting that the fit of our model to the data was acceptable (Browne & Cudeck, 1993). Figure 1 lists the significant path coefficients. As expected, student's age had a significant and negative direct effect on all three outcome variables of PI ($\beta = -.16$, $p < .01$), mathematics engagement ($\beta = -.12$, $p < .05$), and mathematics performance ($\beta = -.42$, $p < .01$), indicating that younger students tended to have high levels of PI, mathematics engagement, and mathematics performance. However, gender did not show any significant coefficients.

Consistent with the correlation results, parental involvement produced a significant coefficient for mathematics engagement ($\beta = .21$, $p < .01$), indicating that when parents showed high involvement for their children's gaming behavior the students tended to show high mathematics engagement. However, parental involvement did not reveal a significant coefficient for mathematics performance. Importantly, students' mathematics engagement produced a significant coefficient for mathematics performance ($\beta = .12$, $p < .05$).

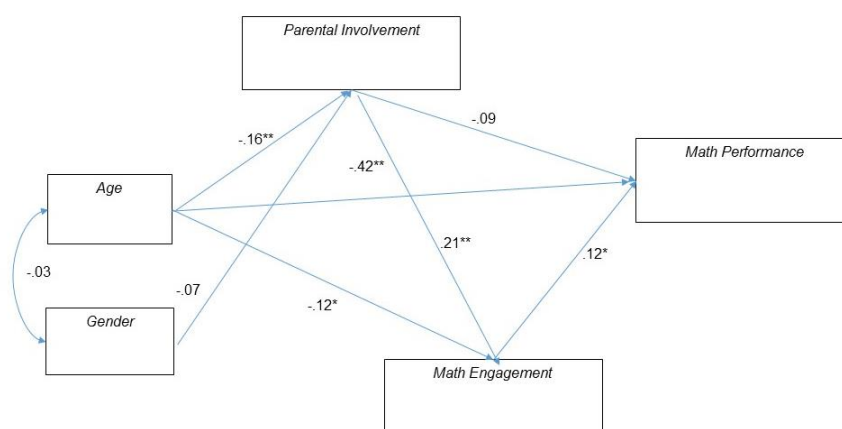


Figure 1. Path diagram for variables and coefficients of paths

Summary and Conclusion

In this study, this research examined the effects of parental involvement in their children's gaming behavior in attempt to suggest a way to reach a best technology use for both parents and students as suggested by Lewin and Luckin (2010). If parents actively get involved in their children's gaming by suggesting good games and playing those games with children, the parents can promote children's academic engagement and performance. As Eow, Wan, Mahmud, and Baki (2009) mentioned, the growth of computer games is inevitable in children's lives, the parents should make an effort to get actively involved in their children's gaming behavior. Parents

can make rules for their children's digital game playing, check the content of children's digital games, decide which digital games are good ones with their children and play digital games with children.

This study shared the same notion in attempt to guide students' gaming behavior and examined the effects of parental involvement in students' gaming on students' mathematics engagement and performance. The results showed that although parental involvement in children's gaming did not show significant direct effects on students' mathematics performance, it had a significant effect on mathematics engagement that made a significant effect on mathematics performance.



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Contact email: midchang@fiu.edu

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Assessing the applicability of 3D Hologram Technology as an Enhanced Technology for the Distance Learning

Pradeep Kalansooriya, Nagaoka University of Technology, Japan
Ashu Marasinghe, Nagaoka University of Technology, Japan

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Abstract

Distance learning has provided an excellent platform for students in geographically remote locations while enabling them to learn at their own pace and convenience. A number of technologies are currently being utilized to conceptualize, design, enhance and foster distance learning. Teleconferences, electronic field trips, podcasts, webinars, video conferencing and online courses are among such technologies used in providing distance learning opportunities. However limitations in those existing technologies have affected to the increase of distance learners dropout rates. As an attempt to overcome the limitations in the currently adopted distance learning practices, the study aims to utilize 3D Hologram Technology (3DHT) in the Engineering discipline. 3D hologram facilitates live and life size 3D telepresence that can interact with remote audiences. A survey had been conducted, using Delphi Technique to gather data from the experts in the field to evaluate the potential of 3DHT over existing technologies. Results of the survey suggested that 3DHT as a good distance learning technology and have the potential of overcoming existing limitations. Lack of infrastructure, High initial cost of infrastructure and Lack of technical know how are the main encounters identified by the experts in the sample. It is expected to develop a classroom environment with 3DHT and to evaluate its effectiveness for the distance learning in the next stage of the study.

Keywords: Distance learning, 3D Hologram technology

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Introduction

Distance Education

Distance Education or Distance Learning is a field of education that focuses on teaching methods and technology with the aim of delivering teaching, often on an individual basis, to students who are not physically present in a traditional educational setting such as a classroom (Subrahmanyam & Ravichandran, 2013). Fundamentals of distance education are that teachers and students are in different places for all or most of the time that they teach and learn. Hence it requires some form of communication technology to connect the teacher and the student. Accordingly, Bratt (1977) stated that history of distance education dates back to the early 18th century, nonetheless conclusive evidences were found in 1833 in the form of advertisement by old Swedish university city of Lund, which offered opportunities to study through the medium of the post. Another early attempt to provide distance education was made in England by Isaac Pitman who taught shorthand on postcards (Holmberg, 2005).

Distance Education has progressed in leaps and bounces due to the fast evolution of communication technology allowing faster and convenient opportunities for the students and teachers. Webinar, Teleconference, Podcast, Virtual world and Blogs are some of the modern communication technologies used in Distance Education. Some of the modern communication technologies and their advantages and disadvantages had been summarized in Table 1. Accordingly, difficulty of interacting between teacher and student was noticeable in different levels on almost every technology compared to the conventional classroom interaction with teacher and student. Hence developing innovative communication technology, which eliminates difficulties of interacting between teacher and student, will be exciting area of research.

Table 1: Advantages and Disadvantages of exiting communication technologies of Distance Education

Communication Technology	Description	Advantages	Disadvantages
Webinar	Instructor leads the learning, and all learners are logged on simultaneously and communicate directly with each other (Shi & Morrow, 2006)	<ul style="list-style-type: none"> • Ability of real time sharing of knowledge and learning • Opportunity for immediate access to the instructor to ask questions and receive answers 	<ul style="list-style-type: none"> • Only 2D communication can be possible, hence good interaction cannot be possible • Requires quality bandwidth and computing power
Virtual world	Computer simulated environment that enables users to interact with each other without geographical confines. An avatar represents each user.	<ul style="list-style-type: none"> • Ability of interacting large number of communities • Ability of cost effective and robust simulation for 	<ul style="list-style-type: none"> • Avatar or graphical representation is not real, so that the interaction between the parties are artificial • Requires quality

	(Harris & Rea, 2009)	educational activities	bandwidth and computing power
Podcast	It involves downloading a series of audio or video broadcasts (files) onto a digital media player, via a computer, over a period of weeks (Evans, 2008)	<ul style="list-style-type: none"> • Ability of using the materials repeatedly • Ability of using any time user want 	<ul style="list-style-type: none"> • Only one sided interaction is possible • They are stagnant. Once created, they cannot be changed or modified
Text based materials		<ul style="list-style-type: none"> • No special facilities or equipment are needed to use it • Ability of easy navigating; random access of specific portions is convenient and fast 	<ul style="list-style-type: none"> • Interactivity is more difficult to achieve with print than with some other media
Electronic field trip	Use digital and computer visualization techniques based on the personal computer and internet (Qiu & Hubble, 2002)	<ul style="list-style-type: none"> • Ability of presenting trips to inaccessible areas • Provide an alternative of fieldwork, when time, expenses, and/or logistics are real issues 	<ul style="list-style-type: none"> • Do not convey the true three-dimensional nature of objects • Do not convey the non-visual and aural feelings of touch, smell etc

Among all these technologies, Virtual Environments (VE) have been subjected to many researches over the years for its potential of facilitating for education in many disciplines, such as, learning sciences, computer science, psychology, communication, etc... (Bailenson et al, 2008). There are number of learning opportunities provided by VEs as learning modules stems from their ability to implement contexts and relationships not possible to achieve in a traditional learning setting.

Embodiment of Agents that Teach and Learn

In recent studies many efforts have been made to create intelligent virtual agents who teach a learner about a specific domain. Rickel and colleagues' work (1998) on evaluating the possibility of using virtual agents in performing complex mechanical tasks in a learning VE, the creation of a virtual tutor for teaching the fundamentals of hardware and operating systems developed based on the natural language processing interface (Hill et al., 2003), the digitally augmented dollhouse that encourages children to tell stories as a way of promoting literary competencies (Cassell, 2004) are some of the noteworthy examples of such. Virtual agents not only allow a user to enter into a learning experience at his or her own convenience, but they can also provide personalized one-on-one learning experiences tailored to the individual that would be prohibitively expensive otherwise (Baylor & Kim, 2005).

Existence of Co-learners

There is a factual reality on the success rate of students learning in groups outperform students in individualistic conditions (Johnson, Johnson, & Skon, 1979; Wood, Willoughby, Reilly, Elliot, & DuCharme, 1995). Therefore, in the reality, it is a substantial shortcoming of the typical individualized learning environments with virtual teachers. However the introduction of co-learners in VEs, as a solution for the aforementioned issue, have been thoroughly studied and confirmed conceivably better than a traditional classroom since virtual co-learners can be programmed to behave specifically to enhance each user's learning process (Bailenson et al, 2008). Studies conducted to evaluate the credibility of having virtual co-learners in the process of learning suggest that co-learner's positive behavior can enhance a user's increased performance (Ju, Nickell, Eng, & Nass, 2005).

Visualizations

Visualization is one of the salient features of VEs. It helps the users with visual, haptic and auditory cues to enhance and swift between different perspectives of a given set of complex information. For an example, the study conducted by Perdomo and the team in 2005 concluded that abstract concepts such as architectural settings, engineering setups, or chemical structures can be conveniently understood by the user, if they were enabled to create, alter, and rotate in real time three dimensions. In addition enabling users with multiple perspectives on the same situation -central, peripheral, bird's-eye view, and so on, assist them in the learning process through allowing them to understand different aspects of the situation clearly (Ellis, Tharp, Grunwald, & Smith, 1991).

Synthesis of Archived Behaviors

One of the strong suits of VEs, which was highly noted by many scholars, is that every single action that is rendered must be formally represented in order to appear to the users. Subsequently every action carried out by the users can be constantly recorded over time, and assimilation of such data can be used to evaluate behavioral profiles (Bailenson et al, 2008). For example, Rizzo and colleagues (2000) automatically collected the gaze behavior of students in a virtual classroom via head-tracking devices and used patterns of attention and gaze to diagnose deficits in attention among children. Bailenson and team (2008) clearly mentioned that when the behavioral tracking systems become more elaborate, the ability to use this information to track student performance and consequently improve learning systems should become a major advantage of using virtual classrooms.

3D Hologram Technology

Evolution of 3D Hologram Technology (3DHT)

Holography can be referring to as a method of obtaining photographic image in three dimensions (Ahmad, 2014). It involves the use of a laser, interference, and deflection, light intensity recording and suitable illumination of the recording. (Upadhye, 2013) specified that the term hologram be composed of the Greek terms, "holos" for "whole view" and gram for "written". However the technical term for the holography is wave front reconstruction.

Dennis Gabor Hungarian Physicist is considered as the father of Holography as he invented this technique when he was working on to improve his electron microscope. However

(Chavis, 2009) noted that the technique was not fully exploited till 1960s, as the laser technology had not been improved to standards. Records indicate that by the time of 1962 scientists in both in United States and Soviet Union had developed 3D holographic technology. Today Holograms is expanding its boundaries from science fictions to one of world's attractive communication method. Live and realistic 3D hologram representations can now interact with their distance audiences whether they are a band or artist performing on stage, a politician delivering a keynote speech, announcers broadcasting a live program simultaneously from different places or a CEO holding an interactive meeting with colleagues around the world.

Process of 3DHT

As per the following figure 1 the two laser beams reach the recording medium, their light waves intersect and interfere with each other. Those interferences are imprinted on the recording medium and can be considered an encrypted version of the scene. In order to view its contents require a laser beam identical to the original light source used to record the hologram. When such laser is beamed at the developed film, it illuminates the hologram and it is diffracted by the hologram's surface pattern. This phenomenon produces a light field identical to the one originally produced by the scene and scattered onto the hologram. The image this effect produces in a person's retina is known as a virtual image.

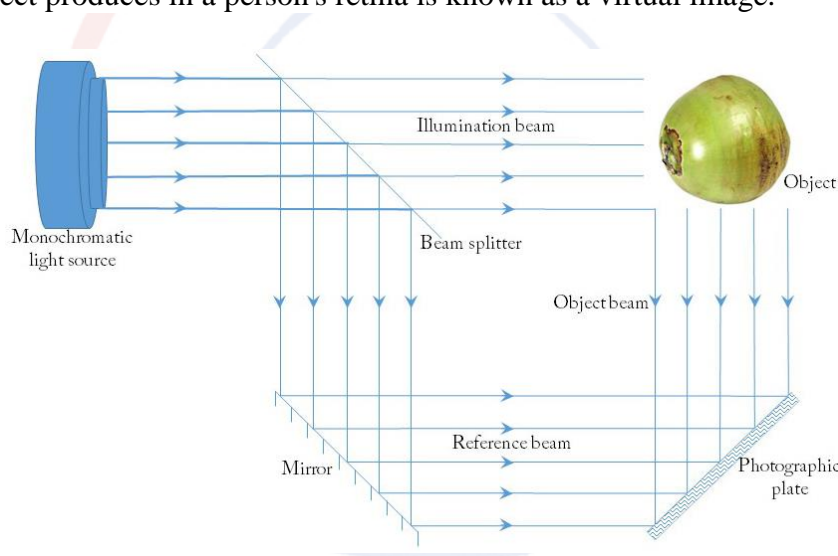


Figure 1: Recording a hologram

About some of the famous examples, which are recognized as implications of 3DHT, there are some contradictive opinions expressing that those are truly not 3DHT implications. Narendra Modi's election campaign and Michael Jackson performance on the 2014 Billboard Music Awards are two such events that commonly considered implications of 3DHT but have contradictive opinions. Some expertise argues that those events are advancement of Pepper Ghost Technology. "Pepper's Ghost" occurs when a semitransparent image appears in front of a background and it involves reflecting an image from a beam splitter placed in front of a scene. "Pepper's Ghost" provides only a single reflection. It does not allow multiple planes of transparent images. Furthermore, it cannot produce images that pass through each other in a direction parallel to the optical path to the viewer. Figure 2 simply graphically demonstrates the process of Pepper's Ghost.

Table 2: Recent real-world implications of 3DHT

Example	Description	Features
Narendra Modi's election campaign	The prime minister of India, Modi used holographic technology in his election campaign 2012. He Addressed the voters in different locations simultaneously through filmed speeches by broadcasting them live via a satellite uplink to the stages. (Musion, 2014)	Offered a 3D convincing view of the president. Addressed different locations simultaneously
Election result broadcasting on CNN - 2008	At the election coverage program 2008 in America announcer in Chicago was beamed up into Wolf Blitzer's studio in New York with a very realistic display. This event attracted millions viewers to watch the hologram effect via a YouTube clip.	Sensed that two announcers were at same place. Interaction between announcers were attractive and efficient Realistic view of the announcer
Michael Jackson performance on the 2014 Billboard Music Awards	Beaming Michel Jackson's performance on to the stage commenced billboard Music Award 2014. (Gallo, 2014)	Performance was creative and attractive as the famous character brought to life again.

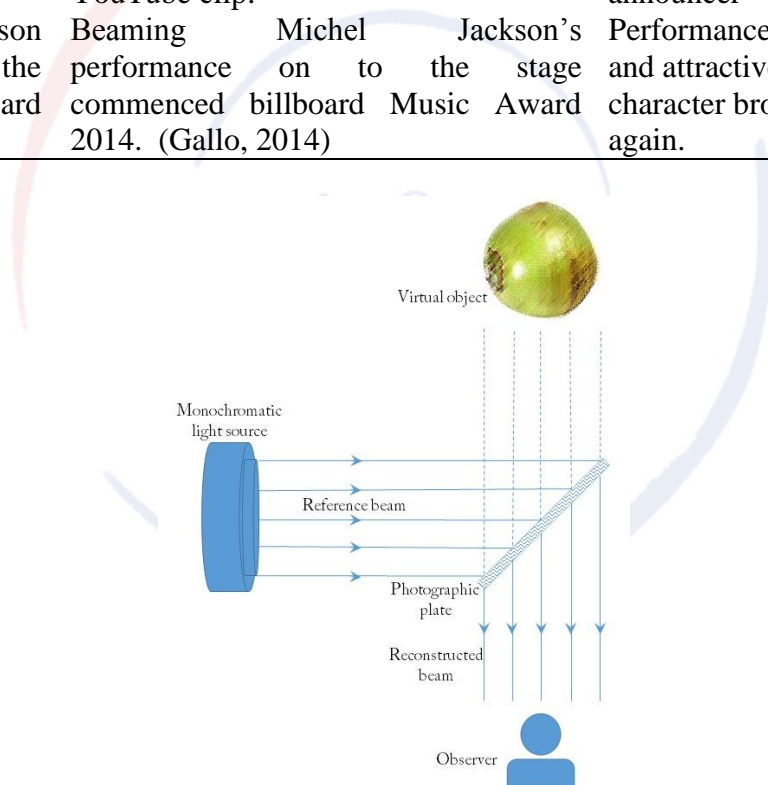


Figure 2: Reconstructing a hologram

Despite the contradictive arguments most of those implications are considered as implications of 3DHT. To conclude appropriate definition and process requires deep review of literature, which is not in the scope of this study. Hence both those processes are considered under 3DHT and implications from both processes are taken in to consideration in latter parts of this study.

Implications of 3DHT

Currently 3DHT is 3DHT has been used in many fields due its increasing popularity. Some of the recent implications are summarized in the table 2. “Narendra Modi’s” election campaign by using 3DHT was noteworthy example. As India is a very large country successful election campaign is a challenging task. Using 3DHT for the election campaign helped the speakers to address different locations simultaneously through filmed speeches by broadcasting them live via a satellite uplink to the stages. Those views of the politicians were very convincing, thus it was very attractive and touched the people who had never seen a politician addressing them so close to them. Another example of 3DHT, which attracted millions of YouTube viewers, was Election result broadcasting on CNN – 2008. It allowed two announcers in two different places to broadcast the results with better interaction and creativity. Michael Jackson performance on the 2014 Billboard Music Awards was another exciting example 3DHT. It was a fascinating and creative performance for the fans of Michael Jackson as the famous character brought to life again. In addition to above examples, some of Museums using 3DHT to bring world-renowned masterpieces to life again.

The Importance of 3DHT on Education

It may possible to take advantages of some of the features mentioned in the table 2. Those features in the table 2 can be review and summarized as follows;

Ability of offering convincing and realistic view of the user

- Ability of communicating users in different locations
- Ability of attractive and efficient communication
- Ability of bringing famous characters back to life

Students and teachers can afford to communicate and interact each other’s even they were in very far from each other as its ability of communicating from different places. Students might be benefited by the realistic and convincing views of the study materials. The hologram teacher appears to be in the classroom, and can see and speak to the students as if they were all in the same room, which enables attractive and efficient interaction between student and teacher. Further to that it can enhance the educational process by bringing famous characters to life again from the past, and they speak about themselves and/or explain something as an assistant teacher would be attractive for the students. However those potentials have not been testified realistically yet. Thus this study attempts to provide and initial groundwork for the above purpose.

Methodology

Questionnaire and Sampling Procedure

The questionnaire adapted in this study comprised with three parts with an objective of evaluating experience and ideas in a distance-learning environment. First part of the questionnaire aimed to compare important factors in teaching environment and evaluate the level of importance of video based education and hologram based education. Important factors in teaching environment which were used in the questionnaire is shown in figure 1. Second part of the questionnaire focused on the evaluation of the applicability of hologram technology in classroom environment by identifying major barriers and technical difficulties in implementing a hologram based classroom. Finally, the third section comprises of general

information of the responder. Qualitative responses were quantified through a 1 to 5 Likert scale where 1 indicated the strong disagreement while 5 indicated the strong agreement level.

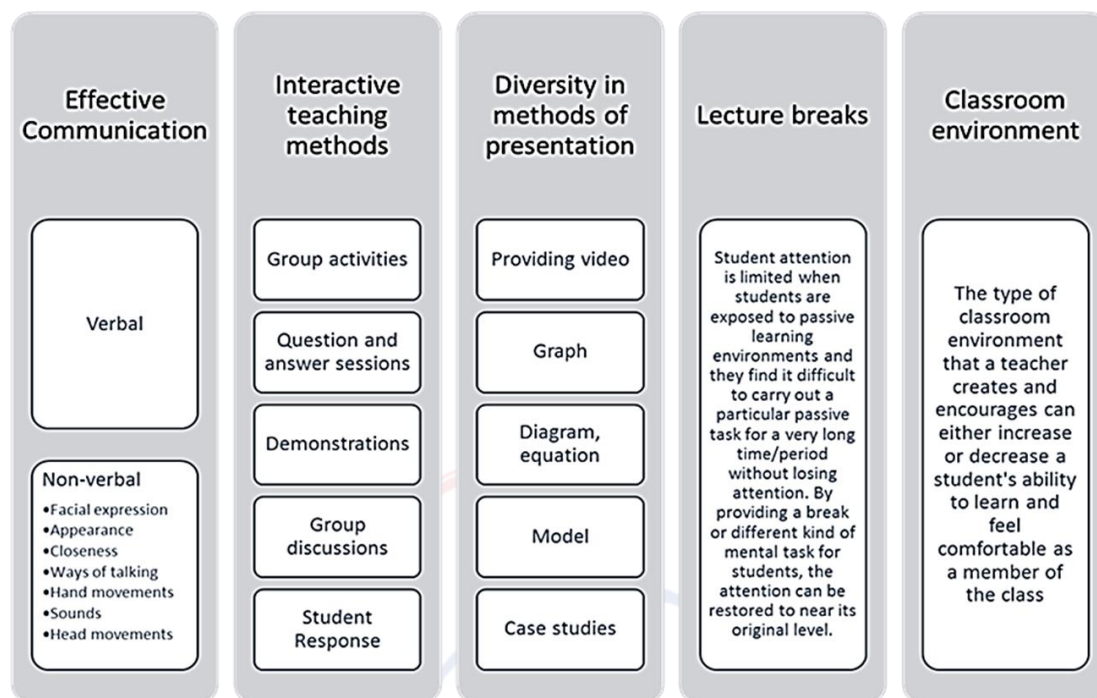


Figure 3: Factors and indicators of effective teaching environment

Since, 3DH is a developing technology therefore the awareness about 3DHT is at a lower point among general public, experts' views were considered for the study. The Delphi technique¹ was used in selection of the sample of 25 each from two categories; University Academia, and IT related professionals. Only 17 (43.6%) and 22 (56.4%) participants have responded and considered valid for the analysis of the study respectively.

Analysis Procedure

Data obtained from the survey had been analyzed in three stages using Analytic Hierarchy Process (AHP), Descriptive analysis, and Analysis of Variation (One-Way ANOVA) consecutively. AHP was used to conduct a pairwise comparison of factors of effective teaching environment and thereby to evaluate the suitability (according to the perceptions of participants) of Video technology based education and Hologram technology based education. Means and Standard Deviations of the dependent variables; Likability to use 3DHT, Cost effectiveness, and Students' active involvement, were used to describe the behavior of the sample. Finally, the mean differences of groups within separate categories; gender, experience, Profession/ Expertise were calculated using Analysis of Variation (One-Way ANOVA)

¹ "The Delphi technique is well suited as a method for consensus-building by using a series of questionnaires delivered using multiple iterations to collect data from a panel of selected subjects. "(Hsu, & Sandford, 2007).

Analysis

Pairwise Comparison of Importance Of Factors Related to Teaching and Learning Environment

Each respondent in the sample was given an opportunity to make pair wise comparison between ‘Effective communication’, ‘Interactive teaching methods’, ‘Diversity in method of presentation’, ‘Lecture breaks’, and ‘Classroom environment’ and requested to give weights according to the level of importance. According to AHP ‘Interactive teaching methods’ and ‘Effective communication’ are the factors rated highly with generalized weights of 26.58% and 24.13% respectively.

Table 3: Results of pairwise comparison of factors related to teaching and learning environment

Factor	Weights (%)
Interactive teaching methods	26.58
Effective communication	24.19
Diversity in method of presentation	19.88
Classroom environment	16.71
Lecture breaks	12.65

Comparison of Video Based Education and Hologram Based Education for The Factors Related to Teaching Environment

The participants were asked to rank the level of importance on a scale of 1 to 5 where 1 is the lowest and the 5 is the highest. The Figure 2 and Table 3 illustrate the level of importance that each factor received for both teaching mechanisms. Almost all the factors were recorded important other than for lecture breaks for both categories. Additionally Hologram based distance education was recorded important for factors other than ‘Lecture breaks’ in relation to video based education. Further it was statistically proven by the generalized mean of 3.892 (Standard Deviation : 0.453).

Table 4: Comparison of video based education and hologram based education

	N	Minimum	Maximum	Mean	Std. Deviation
Video based distance education	39	1.608	4.355	2.948	0.710
Hologram based distance education	39	2.759	4.747	3.892	0.453

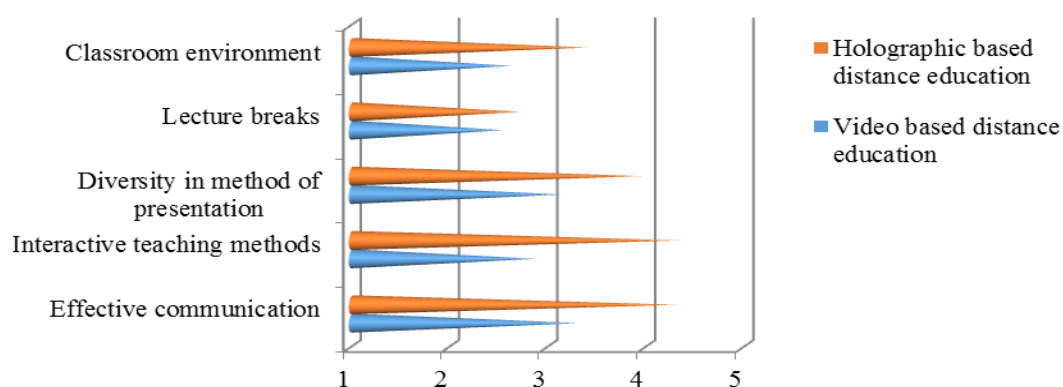


Figure 4: Comparison of video based education and hologram based education for the factors related to teaching environment

Perceptions on 3D Hologram Based Classroom Environment

One –way ANOVA statistical test was performed to test whether there are differences between independent variables; gender, experience, and employment groups.

Likability To Engage

Table 5: Perceptions on likability to engage in 3D Hologram based classroom environment

	N (%)	Mean	Std. Deviation	Minimum	Maximum
Male	61.5	3.96	1.429	1	5
Female	38.5	4.47	0.640	3	5
≤10 year experience	48.7	4.42	0.607	3	5
>10 year experience	51.3	3.90	1.553	1	5
University Academia	43.6	3.59	1.583	1	5
IT related professionals	56.4	4.59	0.503	4	5
Total	100	4.15	1.204	1	5

There is a statistically significant difference between University academia and IT related professionals ($F(1,37) = 7.851, p = 0.008$). No other groups have indicated heterogeneity within groups mentioned above. Tukey post-hoc test was not possible, since there is no any group consists with at least three sub categories.

Cost Effectiveness

Table 6: Perceptions on cost effectiveness of 3D Hologram based classroom environment

	N (%)	Mean	Std. Deviation	Minimum	Maximum
Male	61.5	3.33	0.868	1	4
Female	38.5	3.40	0.910	1	4
≤10 year experience	48.7	3.53	0.841	1	4
>10 year experience	51.3	3.20	0.894	1	4
University Academia	43.6	3.18	1.015	1	4
IT related professionals	56.4	3.50	0.740	1	4
Total	100	3.36	0.873	1	4

There is no statistically significant difference between groups mentioned above.

Students' Active Involvement

Table 7: Perceptions on active involvement of students in 3D Hologram based classroom environment

	N (%)	Mean	Std. Deviation	Minimum	Maximum
Male	61.5	3.38	1.279	1	5
Female	38.5	3.60	1.183	1	5
≤10 year experience	48.7	4.11	0.937	1	5
>10 year experience	51.3	2.85	1.182	1	5
University Academia	43.6	3.24	1.348	1	5
IT related professionals	56.4	3.64	1.136	1	5
Total	100	3.46	1.232	1	5

There is a statistically significant difference between experience groups ($F(1,37) = 13.417$, $p = .001$). No other groups have indicated heterogeneity within groups mentioned above. Tukey post-hoc test was not possible, since there is no any group consists with at least three sub categories.

Major Barriers in Implementing 3D Hologram Based Classroom

Participants responded vividly to the question regarding major barriers in implementing 3DH based classroom. 'Lack of infrastructure' and 'High initial cost of infrastructure' have been identified as the main two barriers with Mean values reached more than 4.00. Additionally 'Limited bandwidth' was also identified as a secondary roadblock in the process of implementing 3D Hologram based classroom (Table 7, Figure 3).

Table 8: Major Barriers in Implementing 3D Hologram Based Classroom

	Minimum	Maximum	Mean	Std. Deviation
Lack of infrastructure	2	5	4.36	0.811
High initial cost of infrastructure	2	5	4.23	0.872
Bandwidth limitations	2	5	3.46	0.854
Backwardness in adapting to new trends	1	5	3.08	1.265
Lack of technical know-how	1	5	3.92	1.178

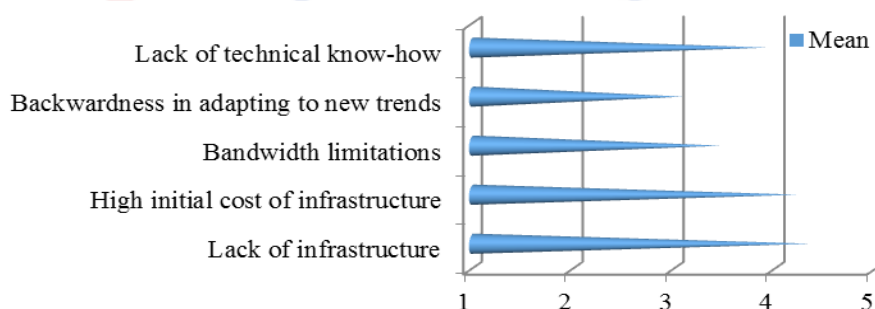


Figure 5: Graphical representation of major barriers in implementing 3D Hologram based classroom

Perceived Benefits of 3D Hologram Based Classroom

At least 30% of the respondents believed that 3DH classrooms enhance the real time experience of students through 3D perceptual effects and effective in both theoretical and practical subject content delivery. Fifteen percent of the sample believed that 3DH classrooms in distance learning have the power to enhance effective interaction between student and teacher while reaching out for mass audiences regardless of distance and time barriers (Figure 5).

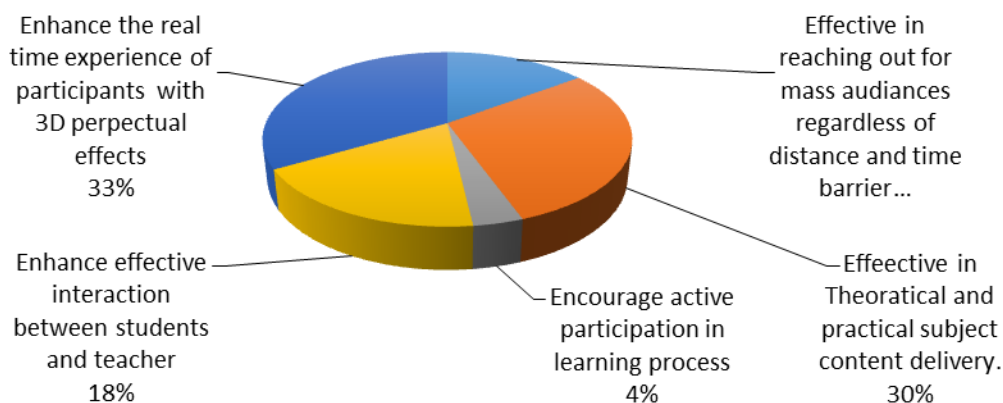


Figure 6 : Perceived Benefits of 3D Hologram Based Classroom

Discussion and Conclusion

3DH is an applicable and strongly appreciated technology for distance education. However, the experts have no clear cut idea about the cost effectiveness and active involvement of students in 3DH classroom. There is a significant difference in perceptions between University academia and IT related professionals on likability to engage 3DHT based classroom. The perceptions on cost effectiveness of 3DHT based classroom does not show a significant difference under any group classification selected in this study. There is a significant difference in perceptions between experience level groups on active involvement of students in 3DHT based classroom. 3DH is an applicable and strongly appreciated technology for distance education.

Lack of infrastructure, High initial cost of infrastructure and Lack of technical know how are the main barriers identified by the experts in the sample. However, respondents believed that 3DH classrooms enhance the real time experience of students through 3D perceptual effects and is an effective mode of delivery in both theoretical and practical subject content.

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Contact Emails: Pradeep Kalansooriya (lpkalan@gmail.com)
Ashu Marasinghe (ashu@kjs.nagaokaut.ac.jp)
K.M.D.N. Bandara (dumindatcp@gmail.com)

Students' Teaching Practices Using Participatory Learning Technique and Multiple Online Learning Platforms

Ista Maharsi, Universitas Islam Indonesia, Indonesia
Irma Windy Astuti, Universitas Islam Indonesia, Indonesia

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Abstract

This paper reports an implementation of peer-participatory learning technique in reflective teaching practices in a teacher training program. The teaching practices, in addition, were enriched with educational technology engagement through the use of multiple online learning platforms namely Klasiber, Facebook, Google Hangouts, and WizIQ. Two modes of teaching (offline and online teaching practices) were tried out with both peer-teaching and real teaching. Data were collected from pre-test and post-test using an adapted teacher knowledge test, reflective notes, and focus group discussions. Results indicate that although students' teacher knowledge test score has only a slight increase (2,72%), their understanding on teaching stages, material adaption, classroom management, and awareness of offline and online teaching aspects are noticeably growing. While the use of Klasiber, Facebook, and Google Hangouts were successfully employed throughout the sessions, WizIQ was in total failure due to some technical problems. This study highlights the significance of trials, peer review, feedback, and reflection as urgent components to be employed in teaching practices. In the same sense, motivation, perseverance, and persistence are elements required to succeed in acquiring new experiences.

Keywords: peer participatory learning, online learning platforms, klasiber, Google Hangouts, WizIQ

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Introduction

Within the digital technology era where advances and innovation may occur within few seconds in timely framework, teachers and researchers are demanded to get along with it and embrace it into their professional development. Teachers, in particular, need to update and redesign their classroom practices to comply with the daunting changes. Information and Communication Technology, without reasons, should become a part of learning and teaching processes. Referring to the term used in McCrindle Research (2006), the current undergraduate students in university mostly fall to the category of Generation Y, a group of people born between 1980 and 1994. Indeed, there is no wonder that this generation is so much interested and inseparable with anything related to technology. Data of internet users in Indonesia only comprise for 2 million people in 2000 and the number soars to 55 million users in 2012 (Internet World Statistics, 2012). It can be predicted that within the next 3 years all students in the secondary level are generation Z. This will suggest that students now studying at a teacher training program degree, when choose to become teachers, will be teaching students from generation Z, a generation that was born between 1995-2009 (McCrindle Research, 2006).

Gearing to the phenomenon of future student generation, teachers are correspondingly demanded to master technology and adopt it in their teaching practices. This underlies the urgent need for curriculum developers and teachers to evaluate their designs. Teacher training programs in particular is challenged to offer better comprehensive program integrating content and technology. Micro teaching courses should be improved to accommodate both traditional teaching face-to-face which is fully classroom-based learning and online classrooms. There are various number of learning management system (LMS) that can be used. At Islamic University of Indonesia, online learning is accommodated through class cyber (Klasiber). However, other online learning platforms such as Google Hangouts and WizIQ can also be utilized.

In this study, three online learning management systems were used to provide learners with meaningful experiences in doing offline and online teaching practices. The three systems can be used as a compliment for the other. One feature that is not available in one software can be replaced by another. Peer participatory learning is adopted in this study due several reasons. First, it gives opportunities to learners to learn in groups and actively participate through interaction and communication among the members. According to Kohle, learning stages for adult learners turn into concrete experiences, reflection, theory and practice implementation, and new experience construction or modification (as cited in Ajiboye and Ajiton, 2008). It is expected that students having teaching practices with multiple online learning will acquire teaching competencies necessary to teach students from generation Z. They will be required to work in team, reflect their experiences, applying theories into practices, and then they will construct their experiences into a new one.

Research Questions

This research proposes four inquiries:

1. How are peer participatory learning techniques (peer feedback and peer teaching) implemented in Micro Teaching course?
2. How do students perceive the implementation of participatory learning techniques and multiple online learning platforms in Micro Teaching course?

Methods

Twelve students of undergraduate teaching program participated in this study. They took Micro Teaching course with 2 semester credits. However, in practice, the total hours for their micro teaching sessions are similar to that of 4 credit semester. This course is pre-requisite for Field Study Program—a program in which students are sent to high schools and assigned to help teaching English to the students. Micro Teaching course is aimed to train and prepare students to apply all theories they have learned into teaching practices.

Prior to their teaching practices, students are taught about teaching stages, lesson planning, and using media in teaching. All students taking micro teaching course must have passed several courses as the pre-requisites—classroom management, teaching methodology, material development, and language assessment. Students were to have peer teaching sessions in classrooms (traditional method) and real teaching sessions with real students (online teaching) using Google Hangouts and WiziQ. Students were trained how to use those two applications and they have some trials sessions prior to their teaching practice sessions. Klasiber, in addition, is used to upload teaching materials and store data about pre and post teaching preparations. Discussions on particular issues can also be uploaded on to the Klasiber and further discussions can be continued in classrooms when necessary.

A pre-test was administered at the first meeting and a post-test at the end of all sessions. During the offline teaching practice sessions, students were assigned materials and given the schedule for their teaching practices. They had to prepare for the lesson plan and media that would be used in classrooms. Students were encouraged to consult with teachers when preparing for the lesson plan and teaching media. Each student was given 40 minutes for each teaching practice. During the teaching practices, their peers were required to fill in observation forms which would function as peer feedback and evaluation. The practicing students, similarly, had to fill in the reflective teaching forms after their teaching practice sessions were over. This is aimed to raise their awareness of their teaching practice aspects they needed to improve. At the end of each teaching practice session, a class conference was conducted to give the opportunities for the teaching students to evaluate their own teaching practices while at the same time receiving feedback and comments from their peers. In the same way, teachers support the class discussion with valuable feedback on the whole teaching practice sessions including teaching stages, teaching materials, media, interactions, and classroom management. Rubric for lesson planning and teaching practices were used to assess students' performance. All teaching activities were videotaped.

The online teaching practices were also conducted in the same way as that of the offline mode. The procedures, peer's and teachers' feedback, reflection, and evaluation were all carried out and all online teaching practices were recorded using Snaggit software application.

This research employs a mix-method approach and data were collected from pre-test and post-test of teaching knowledge, observations, documents, and focus group discussions. All data were collected, reduced, categorized into themes, and analyzed. The pre and post test results will be used to measure students' teaching knowledge while other types of data were used to describe experiences, procedures, and other related learning reflections.

Literature Reviews

Teaching media have been extensively used in classrooms either single learning medium or multiple learning media. Klasiber, a Moodle-based learning management system, has been used in Universitas Islam Indonesia since 2010. All academic affairs are connected and controlled using the Klasiber and e-learning is highly encouraged to be used. One important to bear in mind is that e-learning should not replace the face-to-face teaching. E-learning is aimed to equip students with soft skills of computer and digital literacy significant for their future career development.

A large number of studies on how ICT is brought into classrooms have been of great concern for both teachers and researchers. Harmer (2004) suggests that various media may be put into classrooms including the ones made by teachers. In addition, Pritchard (2007) confirms that internet has played a very important role that teachers need to induce various teaching approaches to teach using the internet. Mullamaa (2010) resonances that e-learning gives many benefits to learning such as easy access, customized need and interest, as well as enhanced skills for information search through the internet. Although internet use and online media for learning and teaching remain debatable in term of their benefits and drawbacks, one essential issue to be immediately tackled is how to effectively bring the technology into classrooms with any possible best approach to achieve learning objectives. The underlying reason behind all those is nonetheless the characteristics of the digital native generation.

In this study, peer-participatory learning technique and multiple online learning platforms were implemented in Micro Teaching course. Kohle argues that in participatory learning technique students actively participated in interacting and building relations among its members (as cited in Ajiboye and Ajiton, 2008). This participatory learning strategy give spaces to four stages of adult learning, such as concrete experiences, reflections, theory application in practices, and construction/modification for further new experiences. Multiple online learning platforms, on the other hand, refer to the use of three learning management systems, namely klasiber (a learning platform particularly designed for the internal use of Universitas Islam Indonesia's academic members), Google Hangouts (a chat feature offered by Google where up to 10 people can communicate synchronously), and WizIQ (a subscribed online learning platform that offers some features such as video conferencing, whiteboard, chat, and screen)

Cohen (2010) mentions some competences that need to be acquired by teachers-to-be such as understanding on curriculum, evaluation, and ICT to support the teaching and professional activities. Similarly, Warschauer and Meskill (2000) confirm that ICT should be used as not only teaching media but also communication media that can be accepted and used in accordance to students.

PLA (Participatory Learning Approach) rooted from the views of Vigotsky and Piaget (Shen et al, 2004). In PLA, the members of a group participate in a learning process to meet their needs, opportunities, and actions in order to make a change on something (Pretty et al, 1995). Further, Pretty et al (1995) explains that this approach supports innovations, varieties, and complexities. It also opens for interactive learning that leads to open thinking patterns and experiences. Kohle defines PLA as a learning approach in which students play an active role in the learning processes. Interactions between teachers and students are visible through four stages: real experience, reflection on experience, putting theories into practices, and experience modification for further new experiences (as cited in Ajiboye and Ajiton, 2008).

In this study, peer participatory learning technique involves all students to give, take, reflect, and evaluate their own teaching practices as well as their peers'. This approach requires students to actively participate in the process of teaching practices because they have to do the reciprocal activities. Students are given full opportunities to teach their peers as well as to evaluate them. They observe their peers' teaching practices and are observed respectively. It is, therefore, expected that they understand the feeling of being students as well as teachers. Given this valuable chance, students will be able to construct their own meaning for being good teachers and good students at the same time.

Findings and Discussions

The offline mode of Micro Teaching practices were successfully conducted, however, there were some problems emerge during the online mode sessions. Only two online learning platforms that could be used (Klasiber and Google Hangouts). Students are basically familiar with Klasiber since it is used since they became students in the university. Google Hangouts is a user-friendly platform because it can be operated in Android-based Smartphone. Unfortunately, we encountered some technical problems with WizIQ and that was so disappointing for students. The problems were due to the internet connection and hardware compatibility and that not all students had compatible computers or laptop to support the WizIQ for running.

The Micro Teaching practice is divided into three stages: micro teaching preparation course, training on using WizIQ and Google Hangouts, offline teaching practices, and online teaching practices. In the first part of the preparation course, students were informed with some teaching knowledge such as general teaching skills, the use of teaching and learning media, teaching procedures, lesson planning, and skill integration. Some related assignments were given through reflection forms and discussion over the online management system (Klasiber) was administered. On the second session, teaching practices start with scheduling that includes topic assignment, skills to be taught, and time allocation. When a student became the teacher, others acted as students. After the teaching practice was over, the student teacher had to fill in the reflection form. In the same way, other students filled in the

peer microteaching form. A class conference was then conducted following the completion of the forms. Further discussion and teacher's feedback was also carried out within the time allocation.

In the online teaching practice sessions, the concept of peer-participatory learning technique was implemented through team-teaching. Students were grouped into a group of three. Each group made a lesson plan together and prepared for all learning media needed. A student had to teach ice breaking and presentation stage only, or practice stage only, or production stage only. This needed to be done due to the time constraint.

Data from the focus group discussion indicate that both offline and online teaching practices provide students with meaningful teaching experiences. They learned how to design a lesson plan which needed to suit the topic and the learning objectives as well as deciding classroom activities according to their stages. For online classrooms, the preparation was even much more demanding due to some adjustment on the availability of materials and accessibility of the program or online platform application. Therefore, teachers were demanded to be aware of the different mode of teaching and the techniques to deliver the lessons. There were many teaching elements of offline and online modes that differ in the way they were implemented such as teacher-student interactions, communication breakdown, and types of feedback. In practices, teachers and students had limited interaction in term of undetected body languages or unclear face expression. Giving instructions were as hard as maintaining communication in online teaching mode. Repetition very frequently occurred which was likely due to indirect face-to-face interaction and voice clarity. Although the online learning platforms provided video conference feature, not all the time the feature could be used. The unreliable internet connection seemed to become the source for this problem.

Furthermore, the teaching practices were found really challenging for students. It was also found that teaching peers and teaching real students were completely different, and this becomes even more challenging. In addition, with the trainings of using multiple online learning platforms (Klasiber, Google Hangouts, and WizIQ), students understood how the teaching should be conducted, how the teaching materials should be adapted or adopted, how teachers should be techno-savvy, and how teachers should be ready anytime when technical troubles appear in the middle of online teaching sessions. More importantly, students realized that teachers had to be creative in planning lessons and arranging classrooms' activities. Otherwise, classes would be boring and students became passive and unresponsive.

With the implementation of peer-participatory learning techniques in Micro Teaching classes, students perceive that peer feedback and teachers' feedback are greatly helpful. Feedback, according to the students, is viewing their teaching practices from others' views. This becomes more objective, comprehensive, and salient. Making lesson plans, similarly, is also much clearer when peer and teacher's assistance is present. Their feedback definitely gives richer perspectives for the lessons and the activities. Learning from peer's strengths and weaknesses is able to make their teaching practices better. Lastly but importantly, reflecting what their peer has done during their teaching practices and later on making some improvements for their own learning is indeed a powerful tool leading to self empowerment.

The students' experiences on the micro teaching practices using PLA has clearly proved the benefits proposed by the PLA proponents. As supported by Pretty et al (1995), students learned how to innovate their teaching strategies from observing other students' teaching practices and then reflecting it. Interactive learning, additionally, is salient when peer feedback is given and student teachers made responses. The implementation of micro teaching using the PLA is also in line with what is affirmed by Kohle (as cited in Ajiboye and Ajiton, 2008) in which students are involved in four stages of learning real experiences, reflection on experience, putting theories into practices, and experience modification for future richer experience.

Despite all those positive results of PLA implementation and the use of multiple online learning platforms, there are some issues that require more attention and improvement. Extended sessions for micro teaching is necessary due to insufficient time allocation. Forms for written feedback need to be simplified, infrastructure and facilities are in need for improvement, and trainings on giving clear instructions are similarly deemed essential and should be trained to students.

Conclusion

Peer participatory learning approach is basically student-centered, thus it encourages autonomous learning, students' creativity, participation, and responsibility. In addition, it helps generate positive learning environment in which students provide both assistance and feedback and encourage reciprocal learning. In other words, competition is repressed while cooperation is enhanced. Students' ability in using online learning platforms increases and it is proved by their fluent actions when using the application. Another positive impact on the online learning platform usage is their initiatives to have simulation prior to their teaching practices.

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***Campus Based Students' Perspectives on Strategic Management Simulation:
A Contextual Study***

Jason Evans, Aston Business School, UK
Clive Kerridge, University of Gloucestershire Business School, UK

Absrtact

Although business simulations are widely used in management education, there is no consensus on optimising their application. Our research explores the use of business simulations as a dimension of a blended learning pedagogic approach for management education. Accepting that few best-practice prescriptive models for the design and implementation of simulations in this context have been presented, and that there is little contemporary empirical evidence for the claims made by proponents of such models, we address the lacuna by considering business student perspectives on the use of simulations. Data was gathered from a source of 487 campus-based students, gathered over a three year period. We then intersect the available data with espoused positive outcomes made by the authors of a prescriptive model. We find the model to be essentially robust and offer evidence to support this position. In so doing we provide one of the few empirically based studies to support claims made by proponents of simulations in management education. We follow with suggestions for further research into the employability outcomes of simulation based training, based on the results of our study. The research should prove valuable for those with an academic interest in the use of simulations, either as a blended learning dimension or as a stand-alone business education activity. Further, the findings contribute to the academic debate surrounding the use and efficacy of simulation-based training within business and management education.

Keywords: Simulation, SBT, Management Education, Pedagogy, Higher Education

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1. Introduction

Within the academic literature there is robust debate on the use of simulations as a blended learning dimension. However, few best-practice prescriptive models are presented for the design and implementation of business simulations in the management education context. Furthermore, there is little empirical evidence for the claims made by such models (Mitchell, 2004; Borner et al, 2012). As educators in the field of strategic management, we seek to develop innovative and engaging teaching and learning practices, of which simulation based training [SBT] is a component. This study therefore compares undergraduate business student perspectives with claims made by proponents of one peer-reviewed best-practice model presented in the recent academic business education literature, in the context of blended learning pedagogy.

Our study first reviews the literature on blended learning within higher education management education. Secondly, we explore simulations as a dimension of blended learning. We then conclude the literature review by outlining a seven-stage prescriptive model (Salas et al. 2009) that underpinned our activities and that has therefore been selected for the basis evaluation and validation in this study.

The study then outlines methodology and methods designed and used in the described case example. This is followed by a discussion of the results (outcomes) and findings of student responses to a survey on key aspects of a blended learning delivery that incorporated a substantial business simulation.

The study concludes with a review of the outcomes and student observations, in relation to the cited seven-stage model. We argue that the findings are consistent with expected outcomes of the model, when implemented as prescribed by its authors (Salas et al, 2009). Accepting that there is little empirical evidence to support claims made by proponents of best-practice models, our study addresses the lacuna in the literature relating to SBT in management education as a component of a blended learning pedagogy. It is considered that the findings will be of value to Management Education professionals and other training providers in evaluating and delivering SBT.

2 Literature review

2.1 Blended learning

In recent years ‘blended learning’ as both a term and pedagogical approach has gained significant currency within the Higher Education (HE) sector. In simple terms, blended learning can be considered as a combination of technology enhanced and face-to-face learning (Bonk & Graham, 2006). However, it is argued that it is the effective integration of this face-to-face and technology enhanced learning that will facilitate active learner engagement and foster ‘deep learning’, a state from which positive outcomes for students can be observed (Singh, 2003; Biggs & Tang, 2007; Kanuka, 2003; Bonk & Graham, 2006).

Blended learning has not been without its critics. Some argue that blended learning is nothing more than a marketing buzzword for a repackaged product that adds little that is new. Others argue that the term ‘blended learning’ is erroneous: learning is rarely a result of ‘blend’ and that what is really being addressed is delivery of teaching, implying that the term ‘blended learning’ needs to be reconsidered (Oliver & Trigwell, 2005). Further arguments contest that the use of such pedagogical approaches may be more influenced by the external political environment and economic imperatives than enhancing the learning experience (Carr, 2005). Indeed, it has been argued that many adult learners returning to education may have ‘phobia’ relationships with computers and/ or lack the technical skills required to fully engage with blended learning approaches (Saade & Kira, 2009).

Such critiques, however, do not address the underlying arguments by proponents of blended learning approaches that, despite issues with definition and originality, blended learning has been found to have a wide and varied range of benefits – for learners and for institutions – beyond enhanced engagement and ‘deep learning’ experiences. Furthermore, with supported delivery methods, issues related to technological know-how can be overcome. In the institutional context it has been argued that blended learning provides a cost effective way of enhancing under-enrolled programmes that allows for more flexibility in scheduling whilst retaining face-to-face learning and improved management of teaching loads. Furthermore it has been argued that blended learning approaches help meet contemporary student expectations, leading to a move toward more active learning and student-centred pedagogical strategies (Lorenzetti, 2011; Graham et al. 2005; Lloyd-Smith, 2010).

For learners, discourse facilitated through asynchronous web-based tools as part of a blended learning programme can be more reflective and objective than that in a face-to-face forum. Increased engagement, a more diverse learning experience and, importantly, more breadth and depth of learning have also been espoused as benefits of a blended learning approach. Flexibility for students to balance jobs, families and other commitments with study opportunities; particularly in the context of ‘non-traditional’ students has also been noted as a benefit (Garrison, 2004; DeLacey & Leonard, 2002; Lloyd-Smith, 2010).

In spite of the debate on merits, or otherwise, of blended learning and blended learning pedagogies, it has been argued that in the ever-changing context of technological innovation, higher education institutions must address the concurrent

change in student expectations (Garrison & Vaughan, 2008). The need to reduce the cost of education, whilst increasing education provision to a growing customer base, has become an increasing pressure on higher education institutions. It has been argued that it is these factors that have led to an adoption of the blended learning approach across the HE sector (Garrison & Vaughan, 2008; Carr, 2005).

Traditionally blended learning has been distinguished from enhanced classroom, or purely online, provision through the linkage between traditional classroom activities and web-based e-learning activities (Garrison, 2004; Oliver & Trigwell, 2005). However, it is argued that this position takes too narrow a view as blended learning encompasses a more diverse range of dimensions (Singh, 2003; Oliver & Trigwell, 2005). Therefore in order to promote enhanced learning, blended approaches should combine differing dimensions of delivery media in order that each is complimentary to the other (Singh, 2003). Much discussion on these dimensions can be found in the literature, differentiating between synchronous, asynchronous, physical and online formats along with support mechanisms such as documentation availability and technical support (Singh, 2003; Rossett et al. 2002).

2.2 Computerised/ Online Simulations

In more recent times, computerized or online simulations have been identified as a self-paced, synchronous blended learning dimension that can be utilised as an integrated tool to enhance learner engagement and understanding (Bonk & Graham 2006; Singh, 2003), with the main aims of any simulation being to 'imitate a system, entity or process' (Lean et al. 2006, p.228).

Whilst modern business simulations can trace their roots to the 1960s when experiential learning as a pedagogical approach began to be accepted as a tool for addressing the limitations of more traditional teaching approaches (Keys & Wolfe, 1990; Lean et al. 2006; Gredler, 2004), the use of simulations throughout the HE sector as part of management education programmes has certainly increased dramatically in recent times (Faria & Nulsen, 1996; Avramenko, 2012) and interest in exploiting the educational benefits of such simulations continues to increase (Wideman et al. 2007).

Within the academic literature there is robust debate about the value of simulations in the management education context. Van Ments (1999) argues that simplifications that are misleading, or trivial factual errors that could be made, may negatively influence the outcome of a simulation. Van Ments further argues that the amount of resources required to run a simulation may be restrictive, in terms of time and professional staff required. Others contest that simulation, when compared to case study activities, has no inherent superiority and cannot be considered a panacea and that often no difference in performance against learning outcomes is recognised (Mitchell, 2004).

Yet in spite of this critique, current management education literature can be seen to be positively aligned with the use of such tools. Indeed, the espoused virtues are impressive. For learners these include the advantages of experiential learning and practical experience in addition to an academic education, enhancing the development of management skills, producing more effective managers, provision of

complex and realistic learning environments, provision of a risk-free, experimentation-friendly environment, increase in dynamic knowledge, inherent engagement of learners (and related ‘deep learning’) and the enablement of learner controlled study (Salas et al. 2009; Feinstein, 2001; Keys & Wolfe, 1990).

2.3 The Seven Stage Model

Whilst the majority of simulation-based learning literature critiques and adds to academic understanding, the content tends to be descriptive in nature. As such, the available literature offers few best-practice models for the design and implementation of simulations that would aid facilitators in realising the benefits often espoused by proponents of their use (Lean et al. 2006; Salas et al. 2009). In order to address this lacuna, Salas et al. (2009) propose a seven –stage framework for the implementation of SBT. As the authors do not state otherwise, an assumption is made in this study that the framework is equally valid when used as a component of a module or as a stand-alone exercise.

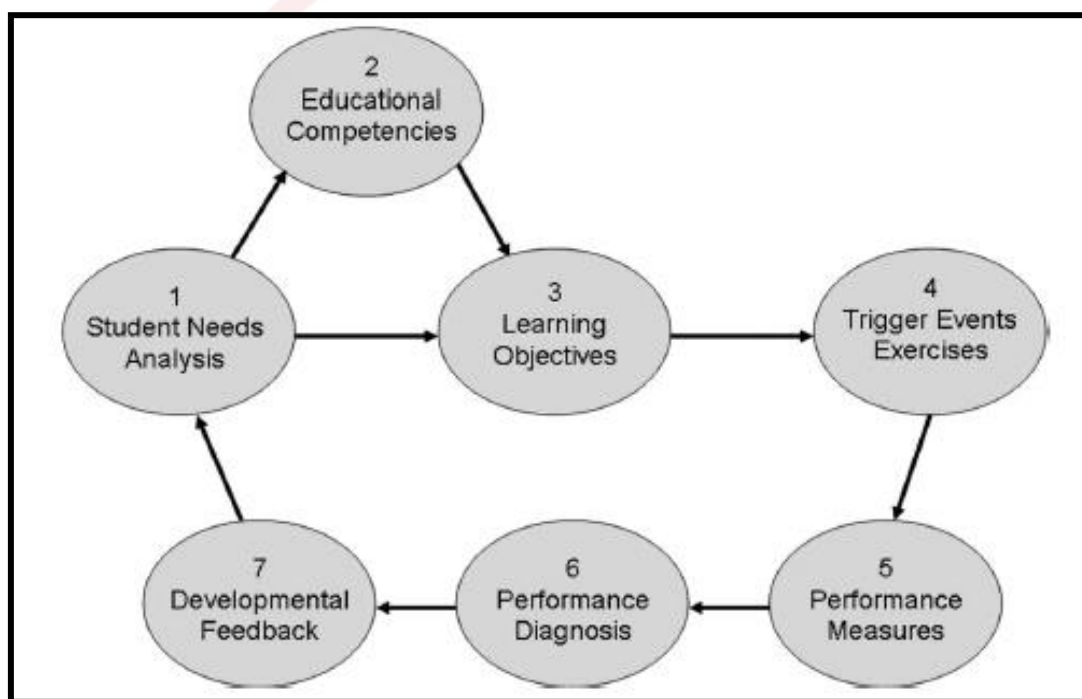


Figure 1: Stages for the Successful Implementation of SBT in Management Education (Salas et al. 2009, p.565)

Student needs analysis entails gaining an understanding of what knowledge and skills the learners possess and what needs to be delivered in training. This stage is likely to correlate to the course or module being taught within management education. The **educational competencies** stage requires the development of a clear understanding of what the simulation will deliver in terms of the change in knowledge, skill or attitude that should occur as a result. The outcomes are more general goals and, in the undergraduate education context, will likely correspond with the overall programme goals/ objectives.

The third stage, **learning objectives**, requires development of specific, measurable training objectives that can either be task-specific or task-generic. These objectives should be as specific as possible, directly address those competencies that have been specified in the needs analysis and clearly outline the requirements for satisfactory performance.

The next stage, **trigger events exercises**, relates to a simulation being chosen that allows for students to demonstrate the competencies required and developed throughout the first three stages of the process. In the management education context, this will likely involve selecting the business simulation that is most appropriate.

The fifth stage, **performance measures**, involves embedding a performance measurement process that is objective, measurable and allows for quality feedback to students.

The **performance diagnosis** stage requires that the measures chosen be used to gather data. This data can then be used to compare against the desired outcomes developed in the first three stages of the process. It is also argued that the performance measures outlined in the previous step should measure both the outcomes and the processes within the training. This, in turn, will allow for the causes of performance to be related to the outcomes at this stage.

Developmental feedback is the final stage of the process. It requires that feedback be given to students throughout the simulation process. In turn this allows for adjustment of strategies and improvement of competencies.

It is argued that successful implementation following the prescriptive model outlined will result in specific behavioural competences:

- 1) Effective problem solving
- 2) Entrepreneurship
- 3) Leadership

Behavioural competences are expected outcomes of the prescriptive model as a value of SBT is that it allows students to apply and practice retained knowledge, not only in improving skills but also in inculcating desired behaviours (Salas et al. 2009). However, the available literature lacks empirical evidence that either support or refute the outcomes that Salas et al. (2009) propose.

3 Model, methodology and methods

Over-arching research objective: To validate a prescriptive model for successful implementation of SBT in Management Education.

The conceptual model developed by Salas et al (2009) was used as the reference point for a three-year data generation and analysis exercise, conducted across three consecutive cohorts of L6 undergraduates at a UK university between 2011 and 2014.

Source data on the student perspective were collected via a mixed methods approach that involved a questionnaire survey, in-depth semi-structured interviews and written student reflections.

A case study method was employed to evaluate student experience and perceptions of SBT, delivered through a computer-based simulation and associated role-playing 'management' group activities and assessments.

A key aim for the case study was to assess the 'fit' and robustness of the cited model, as applied to a typical L6 undergraduate strategic management module for which SBT was part of a blended learning pedagogy approach.

Data collected via questionnaire was gained from a distribution of 526 students, all of whom completed SBT activities as part of their strategic management module study. 487 responses were received (93% response rate). Students were asked for their objective valuation of each stage of the module, including as to how their feelings, attitudes and behaviours changed between the stages.

The findings from analysis of the students' questionnaire and interview responses was also cross-referenced with data for student attainment in the SBT-delivered modules, compared with conventionally [non-SBT] delivered modules. *[these findings will be reported separately]*

4 Case Example

4.1 The Module

This study is based on a 'capstone', double-semester, level 6 strategic management module at a UK university, delivered in academic years 2011/12, 2012/13 and 2013/14. The cohort size in each year was between 160 and 200 final year undergraduates, comprising UK and international (mainly Chinese and EU/Erasmus) students. The majority of students (>90%) were aged between 18 and 23. The module was taken either as a required component for Business Management undergraduate degree courses, or as an optional/elective for students studying related courses such as Marketing, Accounting & Financial Management; Hospitality and Human Resources Management.

The module employed a blended learning pedagogical approach, including whole cohort face-to-face lectures, a series of regular seminars (between sixteen and twenty-five students per class), online content through a module text-specific learning system (including videos, self-assessment and further reading) and a dedicated in-house VLE

(Moodle) site. In addition to this, the second semester work was geared towards an assessment task based around a six week long online simulation exercise, in which students worked in “management” teams of four to six members.

The module delivery was designed to cover three stages of strategy: analysis, choices and implementation. Involving a range of case studies, the first semester encouraged students to build knowledge and understanding of strategic management theories and tools/models e.g. for environmental analysis, strategic positioning, strategic directions and methods. In contrast, the second semester concentrated on the implementation of strategy (*strategy-as-practice*), with the pedagogical focus shifting to an experiential learning approach.

The assessments for the module included a written portfolio in semester one, submitted in two parts – the first for formative feedback, the second for summative – followed, in semester two, by a report on the group-work simulation exercise experience. The report centred on developing and implementing a business plan in a simulated environment, adapting to feedback e.g. from evolving financial and non-financial KPIs, and analysis and reflection on the decisions taken and final outcomes.

4.2 The Simulation – Alignment with the Seven Stage Model

In order to evaluate the seven-stage model against student perceptions, this section provides a consideration of each of the stages outlined in the model in the context of the case study module.

In terms of **student needs** and **educational competences**, the module was designed to incorporate four key elements of the University’s Learning Teaching and Assessment [LTA] strategy: independent and collaborative learning; learning for life and employment; learning for the future (including sustainability and global awareness); research/practice-informed teaching and learning. The module began with a focus on independent learning and the development of students’ research and resource investigation skills. Emphasis gradually moved to the application of knowledge and skills in real-world contexts (simulated or actual). The group-work simulation assignment involved roleplay membership of a global management team, responsible for strategic decision-making – under changing conditions – to ensure a company develops sustainably and profitably over several years.

The aims, **learning objectives** and learning outcomes were defined in the module descriptor, communicated and available to all students through the VLE. A proprietary business simulation was chosen which would enable students to develop and practice the relevant competences, consistent with the specified learning outcomes [LOs] and the LTA elements (as above) i.e. with the three first stages of the SBT model’s process.

Performance measures were outlined and specified through assessment mark rubrics. Furthermore the simulation used had performance indicators embedded into the system, in the form of financial and non-financial key performance indicators [KPIs], released on a sequential basis (see below). Although these provided weekly feedback to groups on their performance e.g. share price and P/E ratio movements,

further feedback was available in the weekly seminars, with opportunities for tutor-group discussions as well as peer-to-peer feedback.

The **trigger event** (simulation) was based around a fictional company, with each student group taking the role of a board of directors responsible for strategic management of the company. Online documents related to the organisation, its environment and core business information were provided for students six weeks prior to the start of the simulation, as part of preparation work. Prior to commencing the simulation, each student group was required to develop a short written business plan for the fictional company, based on the provided documentation.

Once started, the simulation consisted of a number of weekly 'board meetings' that required discussion of three main components: selecting a meeting agenda; deciding courses of action for the selected agenda items; and analysis of outcomes.

Developmental feedback was provided by the simulation tool in the form of company financial statements plus financial and non-financial KPIs. Analyses required reference to a team's own business plan and to relevant strategic management theories and tools. The meetings, and associated reports, were to be completed at the students' discretion, enabling a learner-controlled process that was adaptable to a team's group-working dynamics and practical constraints (such as part-time employment commitments).

Performance diagnosis was based on data derived from two sources:

(a) Outcomes, as measured by the simulation and in the associated assessment reports e.g. attainment grades. Student attainment grades amongst the student cohort were analysed and indicated a substantial improvement in grades of SBT-related assessments in comparison with those for non-SBT delivered components (e.g. conventional case studies) of the same strategic management module. This observation runs counter to the cited Mitchell (2004) findings.

(b) Student feedback, from questionnaires, interviews and reflections. These are discussed in the next section and form a basis for evaluating this blended learning programme through the application of the Salas *et al.* (2009) seven-stage implementation model. Student feedback is critical since each student's experience with the computer-based simulation and the overall module is unique, thus allowing for an understanding of student perception. The questionnaire survey method facilitates collection of data that may assist in generalising some findings. In addition, the interviews and reflections provide deep understanding of students' idiosyncratic situations and outcomes, as students' experiences are a form of symbolic interactionism (Blumer, 1969).

5 Discussion of Preliminary Findings: The Students' Perspective

Student responses to structured questionnaires (n=487) showed substantially affirmative responses to the survey questions about engagement and improvement of skills (see Table 2) associated with the SBT components. The survey outcomes were supplemented by a series of semi-structured interviews (n=65) and written reflections. These are intended to bring an extra level of granularity to the research

analyses and findings. Evaluation of the supplementary studies is continuing and it is intended that findings will be submitted for publication in the near future – also forming the basis for a rigorous longitudinal study, concerned with development and validity of prescriptive models for SBT and their incorporation into blended learning pedagogies for management education.

Table 1: Questionnaire Survey

Survey category (K-S-A)	Parameter (student responses on skills development, in relation to the simulation)	Agree or strongly agree	Disagree or strongly disagree	Mean (0-5 scale)	Std. Dev
A (K)	The simulation enhanced my overall learning in the module	73%	8%	3.82	0.87
B (S)	Helped to improve my team-working skills	81%	6%	4.02	0.83
C (S)	More confident in decision-making skills	71%	9%	3.75	0.92
D (S)	Helped to improve my interpersonal skills	58%	12%	3.47	1.06
E (S)	Helped to improve my communication skills	69%	10%	3.74	0.89
F (S)	Helped to improve my negotiation skills	68%	9%	3.72	0.86
G (S)	Helped to improve my problem-solving skills	69%	9%	3.74	0.87
H (S)	Helped to improve my conflict-resolution skills	61%	10%	3.60	0.84
J (S)	Helped to improve my critical thinking skills	75%	8%	3.85	0.85
K (S)	Helped me appreciate the complexity of business strategies	78%	7%	3.90	0.88
L (A)	The simulation made the module more interesting	84%	6%	4.11	0.94
M (A)	The simulation made me more engaged in the module	81%	6%	4.03	0.86

Table 1 findings indicate that students were strongly in agreement that the module enhanced a number of skills critical to strategic management. These skills are part of the learning outcomes of the module and underpin the three competencies of effective problem solving, entrepreneurship and leadership.

The items in Table 1 reflect knowledge (K), skills (S) and attitudes (A) acquired by the students. These KSAs are a reflection of Stage 1 (Student Needs) and are the conduit that links between Stage 2 (Competencies) and Stage 3 (Learning Objectives). A mapping was performed to link the three stages together and is illustrated in Figure 2. As an example, the competency of Effective Problem Solving (Stage 2 - Competencies) is dependent on Critical Thinking (Stage 1 – Student Needs), which in turn is met by one of the module’s learning outcomes (i.e. Learning

Objectives) of demonstrating effective application of strategic management principles.

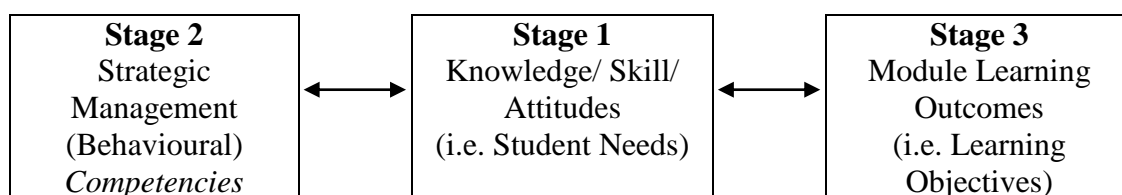


Figure 2: A framework for mapping desired behavioural competencies, knowledge, skills and attitudes acquired, and module learning outcomes

An additional observation from Table 1 relates to the levels of engagement and interest in the module, associated with the simulation: attitude responses L and M generated even higher scores than for perceived skill acquisition. This positive coefficient bodes well for the use of SBT in engaging students.

6 Conclusions and Implications

The findings presented in this paper demonstrate a close alignment with the expectations of a prescriptive seven-stage model developed by Salas et al. (2009), when applied to the case study module and its adopted blended (teaching and) learning strategy of balancing didactic and SBT approaches.

In drawing conclusions we note that “Educational Competencies” may be a misnomer and the label “Professional/ Field Competencies” is perhaps more appropriate. We also note that the assessment criteria only involved Knowledge (e.g. application of theory) and Skill (e.g. written/ communication). Hence, some of the related Learning Outcomes were measured within the rubric, which outlined a continuum of poor, threshold and superior performance. Competencies were not assessed directly as they are latent i.e. it was assumed that the written work reflected the development and application of the problem solving, leadership and entrepreneurial competencies. The main critique here is that competencies are inherently difficult to measure. Salas et al. (2009) mention that a range of assessment techniques should be employed, as was done in the blended learning module delivery studied here i.e. portfolio, business plan, minutes, financial and non-financial KPIs, and reflective essay.

This noted, we find that the obtained and presented data support claims for the expected outcomes of the prescriptive seven-stage model, when that model is implemented as prescribed. The survey data support this position by indicating that the computer-based simulation undertaken, and therefore the model, has positively shaped the students’ strategic management behavioural competencies.

The findings from this study contribute to the academic debate surrounding the use and efficacy of SBT within business and management education. It is found that the Salas et al. (2009) model is relatively robust in terms of the case study module examined in this paper i.e. the use of SBT in this particular context has shaped students’ competencies in a positive manner. The authors propose that this is primarily because each of the seven stages of the model was addressed effectively by the tutor team, during the strategic management module’s delivery. These findings

should prove valuable for academics and practitioners with an interest in the use of simulations, either as a blended learning dimension or as a stand-alone management education activity.

An interesting outcome of the 3 year study was the recognition of student self-perceptions of the development of 'soft skill' or 'employability' outcomes. Further study will be required to gain insightful data on this area.



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Contact email: j.evans4@aston.ac.uk

Foreign Language Acquisition in a Multi-User Virtual Environment

Puji Rahayu, Universitas Islam Indonesia, Indonesia

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Abstract

Learning a language is best achieved when learners can practice the target language in a natural context, or immersed in the target language culture. This will help their L3 acquisition process. Yet, when living in the target country is not possible, a virtual environment depicting target language culture needs to be developed. This paper is to present foreign language acquisition process in Second Life, one of multi-user virtual environment. It is a case study involving four L3 learners enrolled in a virtual class in Second Life called Language Lab, where they can join a formal course. Learners, represented with their avatars, participated in formal classes, virtual practice, and free activity in Second Life. The learners' activities were videotaped to observe their online participation in those activities. The video was then transcribed, coded, and analyzed. Result shows that living in Second Life help them acquire foreign language while communicating with others in a series of engaging activities. This acquisition happens due to the affordances of *Second Life* which can provide experience naturally authentic communication, improve motivation, provide input and output opportunities, and lower communication anxiety. The research also shows that learning foreign language in Second Life is more effective, though needs more time. Despite the success, further research needs to be done about the exact time and appropriate setting for the target language transfer in the real life and research with larger participants to triangulate the result.

Keywords: L3 Acquisition, Second Life

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Introduction

Second/foreign language acquisition is a process of learning second/foreign language undergone by a person (Gass & Selinker, 2008). Unlike first language acquisition during childhood, second or foreign language acquisition most likely happens when the learners are already adult. Many people, however, believe that acquisition is more successful when dealing with communication skills since it can leave the new acquired skill or knowledge last longer in the brain than that of learning. Yet, can acquisition happen more often when learners do not live in the target language countries?

The existence of context in the target language is a vital role to language acquisition. People who are exposed to target language will eventually master the language, though not in perfect grammar. Context will help learners experience natural authentic communication. It is natural authentic communication which will help language acquisition, not direct instruction (Krashen, 1981). In vocabulary learning, the L2 learner, unlike the child acquiring its L1, cannot significantly expand his or her vocabulary solely through exposure to the language input. The exposure to L2 input is often limited to the classroom context. The input may be increased by reading (cf. Ellis, 1997) or listening (Rivers, 1981) in the target language. But these activities, although undoubtedly useful, do not guarantee the development of rich vocabulary. Similarly, formal teaching of vocabulary has its limitations, for, as Rivers (1981: 463) claims, ‘vocabulary cannot be taught’.

Multi-user Virtual Environment (MUVE)

There are some different definitions of MUVE depending on from which perspective the person defines. Wikipedia defines MUVE as “Multi-user virtual environment, or usually called virtual world, is a computer-based simulated environment intended for its users to inhabit and interact via avatars. These avatars are usually depicted as textual, two-dimensional, or three-dimensional graphical representations.... The computer accesses a computer-simulated world and presents perceptual stimuli to the user, who in turn can manipulate elements of the modeled world and thus experiences telepresence to a certain degree. Such modeled worlds may appear similar to the real world or instead depict fantasy worlds. The model world may simulate rules based on the real world or some hybrid fantasy world. Communication between users has ranged from text, graphical icons, visual gesture, sound, and rarely, forms using touch and balance senses. Massively multiplayer online games commonly depict a world very similar to the real world, with real world rules and real-time actions, and communication.”

Second life is one of multi-user virtual environments created by Linden Lab, based in the United States of America. Second life is a graphically rich, persistent online immersive 3D environment which users enter via an avatar, while sharing a technological heritage with massive multiplayer online games, SL differs from them in that it has no set goals, little pre-determined content and no predetermined roles. The majority of the content in SL (buildings, landscapes, etc.) is user created and users can chose any role they wish. It is these two characteristics that also provide educators with the ability to create environments and scenarios highly tailored to their

specific pedagogical needs (Grant, 2008). This research was taken place in Language Lab, a virtual place in Second Life.

In Second Life people can interact with other avatars with different modes ranging from text chat to voiced calls, which can be done privately or in group. When they want to communicate with many people in a certain region, they can just type on the chat or speak by holding the speaker icon while speaking. All people in the region will know the chat. Yet, when they want their conversation become private, they can chat with the intended people.

Besides such communication above, people can also play music, video, and even share presentations with third party-software. As a teacher, we can also share hand out via “note” just like sending emails to the students. Students can take the note by right clicking and saving the note from the teacher. In the development of Second Life, there are many more options that we can do in Second Life.



Figure 1. Places in Second Life

Method

The data was taken from that of the previous research on Speaking Self-efficacy and English as a Foreign Language: Learning Processes in a Multi-user Virtual Environment (Rahayu, 2012). Four UII students taking English classes at Second Life attended formal classes at Language Lab with teachers from different countries. Students also joined some practice classes where a tutor guided students in virtual places to do some life transactions. They bought clothes to wear on their avatars; they chose from the display, bargained, and paid with linden dollar, the currency in Second Life.

Their conversations were recorded with Snagit, transcribed manually, and coded based on the acquisition issues. Learners were interviewed based on the acquisition signal from the transcript. The interview was carried out both offline and online via Second life, Facebook, and Yahoo messenger.

Natural Authentic Communication

Learners attending classes in Second Life experienced authentic communication throughout the course. They communicate in English since they need to convey some messages in their conversation so that they are successful in meeting their purpose. Learners feel that they are given ample time to use the language in the real communication, where in the classroom context they do not have the same opportunities in natural context.

Natural authentic communication supports foreign language acquisition in that learners acquire the language unconsciously. They gain new vocabulary and skills while having meaning negotiated in their communication. The example below shows one participant acquiring new vocabulary while communicating in the target language.

P3 : Sorry Jaz, may I ask something? what about understand to to other personal position. I think It's some kind like er....show our understanding about... yeah, what? erm show that we understand about that position

J : I disagree with you there... You've to be very careful if you said er... I'm not sure about that.

You could er... it depends how we say it; what intonation you use in your voice. So, it would probably it taken more as a bargaining than it could be understanding

“I am not sure about that” (in intonation 1) then that would perhaps understanding if I used that intonation in my voice.

But if I said “I am not sure about that” (in intonation 2) that wouldn't be showing any understanding. That would be certainly about bargaining position

So, I think you should be careful about that you have to sound very understanding

P3 : Ok Jazz, thank you

J : OK

Motivation and Foreign Language Acquisition

The affective hypothesis states that motivation influences foreign language acquisition. Students with high motivation will do better in foreign language acquisition (Krashen S. D., 2009). Learning a foreign language in Second Life increases motivation as one of the participant's mother points out:

“He was very busy lately... He slept very late at night and when I checked he was attending an online class. ...I was surprised one morning when he was already awake and in front of the computer. I could rarely watch my favourite sinetron lately because he was very often in front of the TV watching English programs. Although it disturbed a bit, I was OK because it was always very difficult to ask him to learn English.”

The motivation increase derives from the success of the communication they conveyed when interacting with foreign people via their avatars. Participants claim that they are happy knowing that their English is understood by foreign people. This success is called *enactive mastery experience* (Bandura, 1977), which will improve their self-efficacy. Self-efficacy is believed to have the correlation with motivation. One participant states his experience in the quote below. “... I have learned English for so many years but it was the first time I spoke to people from different countries. Wow! I could speak English, I said in my heart. It made me more confident to talk again in English and I become surer that I could speak English. That was the first time I loved speaking in English. You know, I always hide my head so that the English teacher did not call me to talk in the class.”

Anxiety and Foreign Language Acquisition

Second life is the most advanced virtual world in terms of graphic quality and immersive capability (Warburton, 2009), where users will be able to experience immersive culture when playing in Second Life. Anonymity is another characteristic of Second Life in that users will meet other users in their avatars so that no one will know their real identity. Research has shown that anonymity will lead to lack of identifiability and weak social feedback, which, in turn, can lead to uninhibited behavior (Kiesler, 1985). This will give them freer computer mediated communication. One participant claims that he becomes more confident when communicating with others despite his physical condition.

Computer-mediated communication allows users express their “true mind, authentic self, unfettered by concerns of self-presentation” (Spears & Lea, 1994). This also happens when participants attended online classes in Second Life. They were not afraid of making mistakes and having conversation in English with foreigners. This helps them acquire new expressions in the target language unconsciously. This characteristic of Second Life helps participants decrease self-awareness, which will reduce one’s introspections and concern about how others will react. Two participants give comment on this.

Speaking via Second Life is easier because they do not know me. When I make mistakes, they do not laugh and I can still continue speaking. (P2)
People say that my face is funny when talking in English. They often smiles and it makes me laugh a lot when speaking in English. They do not laugh when I make mistakes. I like it. (P5)

Weak social feedback, uninhibited behavior, and decreased self-awareness are extremely relevant -and beneficial- for language learning. Some of the most important barriers stopping students from using the foreign language are related to their inhibitions and their fear of negative criticism.

Input Hypothesis

The input hypothesis states that someone acquires a new skill when he understands inputs which are a little beyond his current skill. In his book *Principles and Practice in Second Language Acquisition* Krashen (2009) claims that “we acquire only when we understand language that contains structure that is a little beyond where we are now”. How is this possible? People understand structure that they do not know yet when they use more than their linguistic competence. They can involve context, knowledge of the world, and extra-linguistic information to help understand language directed at them. Second Life provides a lot of foreign language context from the users that will be very beneficial for the foreign language acquisition process. The inputs might be much higher than their current competence. Yet, they can eventually understand the input while they are communicating with more people (avatars) in Second Life. Thus, Second Life not only gives inputs but also context for the learners to learn new things during their acquisition process.

"Puji, if you could work with Hino while Itha is not here."

"Hinomoto, If you can just say Hello to Puji"

The excerpt above is one example of input that a participant got from one user of Second Life. One participant learnt that he can use the word “if” as the replacement of “could you..” Thus, he can use both expressions interchangeably.

In an interview sessions with one of the participants, it is revealed that they do not feel worried when they don’t understand some expressions because they can rely on their interactions with other avatars. “Saya sih nggak khawatir Mis. Kalau saya nggak tau apa yang mereka katakan, saya nyante aja. Asalkan saya paham secara keseluruhannya. Tapi kadang tiba-tiba saya dapat jawaban dari apa yang saya tidak ketahuai pada saat saya ngobrol dengan orang lain.”

Output Hypothesis

Unlike when communicating in real life, participants can express their feelings more freely in Second Life since they can “hide” their anxiety behind their avatars. This is in line with the characteristic of anonymity of Second Life. One participant even speaks much more in Second Life, which is very rare in the real life. The excerpt below is the example of how enjoying one participant communicates in Second Life.

- P5 : can you hear me? Nah! OK you see on the right bottom of the screen. (could you see in the right bottom of your screen. there should be an inventory button. click on it)
- A : what is the name
- P5 : Yes, look on ‘clothing’ (V)
- P5 : clothing. you must to expand that folder
- A : i did
- P5 : Yes, you you must go you must expand. try, are you on it? nice!
- A : be concentrated!
- P5 : Sorry. OK you just. The picture is like an icon in the name of the outfit. Yes! you have wear your pants and try your clothes! there should be clothes. You must be take off your clothes.
- A : what about my shirt. all of them see me?
- P5 : i will write it down for you
- P5 : yes2. hehe.. ya.. ya look on your inventory! In the clothing folder there should be er.. ya your cloth is there I think. Hehe.. you cannot naked here. hehe..
- A : how can i wear my shirt
- P5 : are you on the inventory window? have click that inventory button?
- A : i did that
- P5 : okay then. Nice! could you see the clothing folder? have expand that folder?
- A : yeah
- A : okay
- P5 : have you expand that folder? Yeah!
- P5 : Hi Rookie, help me! He is confused how to wear wear his clothes. But he can wear wear
- A : okay
- P5 : okay then. There should be some cloth there. shirt or undershirt, i dont know. can u see it? under only? Nah. Okay. right click on that
- A : and socks

- P5 : nice! Right. try to wear the undershirt; at least you are not naked :p.
right click on the undershirt, and choose wear
- A : okay
- P5 : :)
- A : I did that with trouser and socks
- P5 : okay.
- P5 : if you cant find any clothes in your clothing folder, try to find in the other folder. expand and find! or you can find in the library folder
- A : but i do not see shirt. Okay I will try. thank you Hino.

This participant can produce this much in Second Life which he cannot do in his real life. In this excerpt, he admitted that some expressions and vocabularies are his “new” inventory that he learnt only after “living” in Second Life. He admitted that he acquired some expressions while attending classes and having interaction with other people via their avatars.

The word “expand” was acquired when he was having conversation with his friend during his experiment of using Second Life. At that time, he wanted to change his outfit and he went to a virtual cloth store in Second Life. His virtual friend, the owner of the cloth store, gave him a free cloth to save in his inventory. When he wanted to wear the cloth, he did not know where to find it. He asked his friend who then asked him to expand his inventory folder. At first, he did not know the meaning of expand but when he finally found the cloth he figured out that the meaning of “expand” is like when he click folder to find what are in the folder.

Another example is when he used “there should be” at the first time. Being interviewed where he learnt this expression, he answered that he just knew it while attending some sessions in Second Life. When he tried to use it, the interlocutor knew the meaning. He said, I was successful in using the expression. “Saya pakai there should be ya hanya kira2 aja Mis. Beberapa kali dengar orang pakai kata itu pada konteks tertentu dan konteks itu kok sama. Yaudah saya piker, kenapa ga coba pakai aja ekspresi itu. Dan, pas kupake mereka paham yang kumaksudkan. Kesimpulan saya berarti saya benar dong pakai kata itu.”

Conclusion

The difficulties of finding people to practice with naturally in EFL learning classroom in Indonesia provide opportunities to create or merely use the synthetic environment in a MUVE, which represented real world environment with avatar-based people from all over the world interacting in one screen despite their different physical locations (Rahayu, 2012). This natural communication makes acquisition of foreign language possible due to the affordance of Second Life which can increase motivation, lower anxiety, and provides input opportunity for producing output.

Natural authentic communication is believed to be one main factor in acquiring a new language and Second Life provides this opportunity for people due to the only accepted language in the region is the target language. When they authentically communicate and achieve communication success, they will experience enactive mastery experience, which will increase self-efficacy (Bandura, 1977). Self-efficacy is one main resource of motivation. The higher the motivation to learn the target

language, the more acquisition will take place. Besides, the nature of communicating in MUVE which is through avatars will decrease anxiety since they will not take any account from the feedbacks of corrections given to the users. This will provide more opportunity for the user to produce the target language, which might become input for themselves or for other users.

Despite the high possibility of foreign language acquisition, the exact time and appropriate setting for transfer is still in question. One participant said

It is very difficult to find people to practice English especially with friends. English lecturers also often speak in Bahasa Indonesia not in English. In Second Life we can speak English all the time. So, I don't know if I can practice in real world

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Contact Email: rahayupuji333@gmail.com

Designing Digitally Enhanced Print for International Conferences and Tourism

Eric Hawkinson, Seibi University, Japan
Marin Stack, University of Shiga Prefecture, Japan
Erin Noxon, Sagano High School, Japan

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Abstract

In an examination of the affordances that augmented reality (AR) offers informal learning at larger scale events and conferences, this study looks at the design and implementation of a set of AR based activities at an international event known as TEDxKyoto. Some of the merits of using AR at events include adding incentive to explore the venue and visit vendors and speakers, connecting digital materials to conference print media, and creating a bridge between physical attendees and virtual ones. The results of the experiment shed light on the merits and challenges to using AR to enhance informal learning at international events. One challenge is the cognitive barriers for first time users and limits of AR technology, the study also suggests some design strategies to offset these challenges and well as maximize the affordances of using AR.

Keywords: Augmented Reality, Informal Learning, Events and Conferences, TED, International Exchange

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The Challenge Presented

Consider the following question. If you could change how people see the physical world, how would you use that power to bring people together to share ideas? This is the question from which this paper draws from to start to form pedagogical and psychological reasons to employ augmented reality (AR) and mobile technology for informal learning and international exchange. This paper attempts to tackle this question with an experiment in the use of augmented reality a for large scale international event. The experiment revolves around a set of activities using augmented reality and mobile technology that were designed and implemented at a large international conference. Topics discussed are the affordances of AR, usage goals, design approaches, creation tools, implementation strategies, usage analytics, observations, and ends with a discussion of challenges for future use of these technologies.

The Venue

This year at TEDxKyoto, a new interactive team was assembled and geared to get participants more engaged with speakers, vendors, and volunteers. We wanted to encourage more interaction between all stakeholders both in-person and virtually on-line. Looking to approach the idea on several fronts and link them all together we put together a series of activities that have never been seen at TEDx events ever before. The result was an interesting mix that got great reaction from participants.

The TEDx Program is designed to help communities, organizations and individuals to spark conversation and connection through local TED-like experiences. The focus is on curating an interesting program of speakers and performers to engage audiences. Another goal was creating activities for participants that encouraged interaction. The main of these activities revolved around the use of augmented reality and mobile technology. We created a smartphone application that allowed participants to explore the venue in a way that adds learning value and contributes to the event goals. This app displayed digital information over physical objects all over the event such as signs, artwork, volunteer T-shirts and the distributed speaker program.

AR, VR, and Everything In-between

To understand what affordances augmented reality can give learners and event participants let's first come to define what AR is, how it has evolved, and what different types of AR are. AR is sometimes called mixed reality, and sometimes even confused with virtual reality. While augmented reality is widely considered in the spectrum of mixed reality there is a fundamental difference between augmented and virtual reality. Virtual reality is a completely simulated environment. While the places and things in a virtual environment can be made to act and look like what we see in reality, there are no meaningful connections between the simulation and what it is made to represent. AR has to incorporate something from the physical world. That something could be as simple as a physical object around you, or just your physical location represented by GPS coordinates. Just as the name suggests, reality is being augmented instead of virtually created. What part of the physical world is augmented, how it is used, and even the balance between the real and simulated can vary greatly. This is where the idea of mixed reality is applied and it represents the entire spectrum

between the real world and a completely simulated one. Augmented reality is just one aspect from that continuum (Milgram & Kashino, 1994).

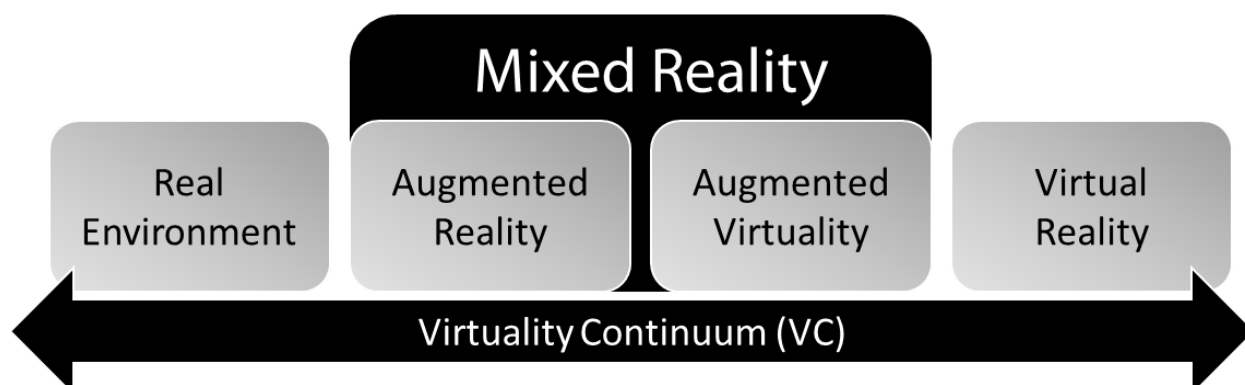


Figure 1. Milgram's reality-virtuality continuum.

Augmented reality has more of the real world represented than virtual, the opposite is true for augmented virtuality which is mostly a simulated environment. An example of AR in this context would be a heads-up-display in the cockpit of a commercial airliner. The view out the front of the aircraft is augmented with information from the various flight instruments. An example would of augmented virtuality might be a digital map of an area that is enhanced with pictures and video from respective locations in an area. Using Milgram's continuum educators can now start to think about where how much the learning can benefit from simulation vs. real-world interaction. Some affordances of AR over VR is the connection to the real world and the inclusion of face-to-face interactions. Situated learning theory states that learning is taken from physical and cultural settings (Brown et al. 1989). That suggests that augmented reality environments have learning merit if it can enhance face-to-face interactions. On the other hand, completely simulated environments have their advantages also. Having the ability to explore expensive to reach or dangerous areas and situations for example.

To capitalize on the value of new face-to-face interactions at events like TED, this experiment uses as much of the physical world as possible and use the technology to augment and enhance participants' interactions with the venue and each other. So in this instance augmented reality in the strictest sense of it definition was used as it is the form of mixed reality that is closer to a complete reality.

Categorizing AR

There are several other ways to differentiate types of mixed reality besides looking at the balance of the real and simulated. Some of those ways has to do with the type of hardware used. The hardware and software capability is a main driver of how AR can be used as seen between the iterations of the last 10 years. An early popular example in 2000 was MagicBook (Billinghurst et al., 2001). It used a desktop PC and a webcam to track and augment simple pre-programmed images and is well contrasted to the much more powerful mobile applications of more recent years is directly related to graphical processing capability that is needed to analyze visual data in real time. But visual data is in most cases only one of the sources of data utilized. On a typical smartphone there are a variety of sensors that can be utilized, a GPS locator,

motion sensors, directional gyros, and radios that can pull information from the internet.

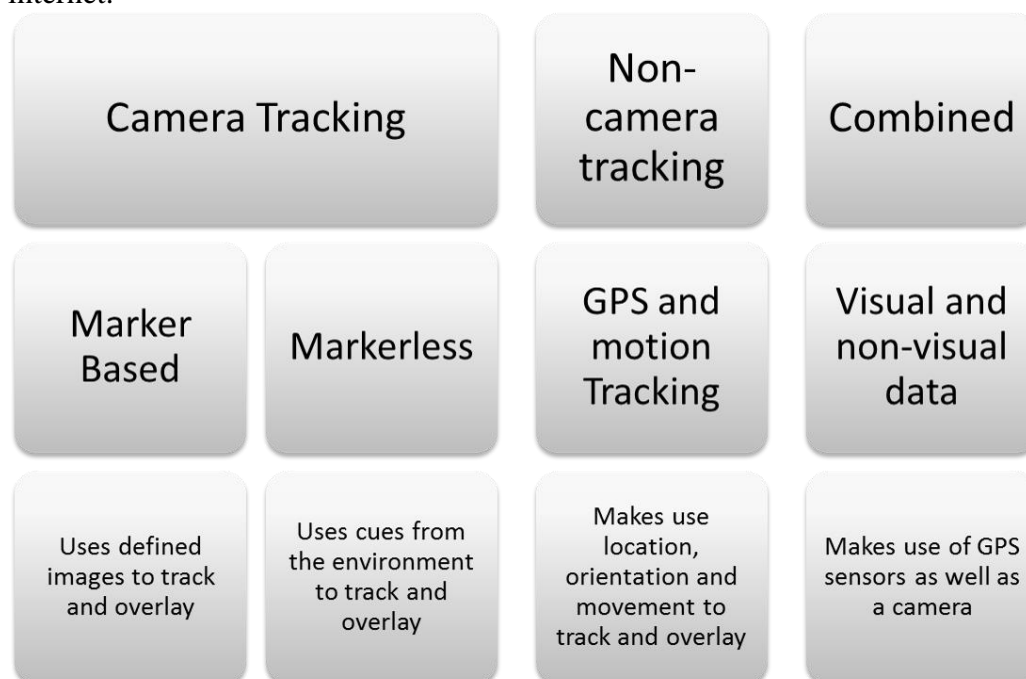


Figure 2. AR hardware technology matrix

For the experiment, the augmented reality smartphone application uses a marker based camera tracking system. This system requires pre-programmed images to be included in the application so that they can be augmented when the camera detects and image.

Affordances of AR for Events and Conferences

Because this technology would be new to most people attending the event and therefore have some motivation through novelty but also reluctance by intimidation of complexity. To maximize the benefits to learning and design and also to successfully pitch the use of AR to event planners, it is important to be able to point out the merits and challenges of implementing this technology.

AR can connect supplemental digital resources to the physical world. This can help turn any physical object or location into a digital learning opportunity. Mobile and desktop applications have been made to display interactive digital content when used with textbooks and other printed materials (Billinghurst et al. 2001; Rambli et al. 2013). This allows AR to be a bridge for e-learning content to be applied to any printed materials commonly found at large events including posters, pamphlets, tote bags, business cards, and banners.

AR can encourage exploration and to try new things. The melding of virtual on to the real world offers a high level of immersion into the content. The digital content is connected to the physical object and therefore instills sense of exploring unknown territory. These effects have been reported when AR was used in educational and game based tourism (Zurzuela et al. 2013; Guttentag, 2010). For the case of

conferences and events this affordance can be pointed at encouraging participants to visit vendor booths or interview special guests.

AR is suited for alignment with constructivist based learning. As AR activities can incorporate exploration of objects and environments, thus is well suited for problem-based, project-based, and other constructivist related learning activities. Applications that have these type have been tested on mobile devices to have a high level of usability (Santos et al. 2014). For events and conferences these concepts could be employed to create some type of game or problem based activity that relates to the overall event theme.

AR can allow you to see the world through a different lens. These applications can use the location and incorporate information and media of another time, or at the same time but in different places. This can allow the user to be transported in time and space and in a sense be put in someone else's shoes. For example in tourism, an augmented reality application was created for visitors to the devastated areas from an earthquake and tsunami in Fukushima, Japan. The application allowed visitors to the area see images taken in the same location taken before the disaster and hear stories from survivors. These empathetic inducing concepts could be used for events which are looking to fight a cause or raise awareness.

Challenges to Overcome

First time users to AR can be prone to cognitive overload. The mix of virtual and real can take some time for the senses to get used to. Also some practice is sometimes needs to correctly position devices in relation to the content to be scanned. Add the fact that you are also to be charged with a new task that requires the use of AR and first time users can struggle (Dunleavy, 2014). To help alleviate these effects for first time users some simple tasks to first learn to use the technology are suggested for the design.

AR use is highly reliant on newer technology and internet connections. AR applications are constantly scanning and analyzing visual data and therefore require a high amount of computational power. This means AR applications are not prone to be compatible with even slightly older technology. For images to be recognized by AR apps they need to be pre-programmed into devices, that can be a problem for devices with limited storage capacity. The large amount of data need to be downloaded for AR applications might cause bandwidth issues at venues with limited wireless internet capabilities.

Design Principles

One particular interesting aspect to this project was observing a wide variety of backgrounds and levels of technological skill interact and/or resist to this type of activity. One of Hofstede's (1983) four cultural dimensions is uncertainty avoidance and it measures a culture's acceptance of ambiguity. This behavior closely linked to how different cultures accept and use new technologies. Uncertainty avoidance levels are represented differently in Japan than many western cultures and has been observed to have an effect of how new technologies are adopted and used (Straub, Keil, & Brenner, 2007). These ideas were observed in several ways, one being the use of flip

and smartphones by participants. Although the application created was available on android and iOS devices, we found some interested participants unable to use the application because they used older phones without a standard operating system. It is why that activities were created that didn't require the use of smartphones.

Ideas for better informal learning and to help spread information from participants to each other and the world over social media were borrowed from the tourism and hospitality industry. User generated data or electronic word-of-mouth (eWOM) has become very important to the travel industry and in particular tourism marketing. Word-of-mouth consumer to consumer communication has proven to be more trusted and effective than normal advertising mediums (Katz & Lararfeld, 1955). Because of the multi-national presence of the event we used Hawkinson's (2012) research model for finding cross-cultural eWOM to choose which social media outlets to integrate into the activities to promote communication virtually during and after the event.

Event Activities Implementation

A smartphone application was adapted for iOS and Android devices. The application was preprogrammed with 35 images that could be found around the venue, inside the event program booklet, and on the T-shirts of volunteers. A simple logo was created and attached to most of these images so users of the application could know that the image could be enhanced. But some of the images that could be scanned were not identified, this was done to strengthen the exploration and constructivist affordances. Information about the application and how to download and use it was placed in the event gift bag and distributed at volunteer stations. The instructions simply pointed participants to application download links via a website or a QR code. To demo and explain the applications use and to give details about the activities a website was created. A short presentation was also given to all participants just before the opening ceremonies. When loaded on a smartphone the application would run a constant visual scan using the device's camera. When a pre-programmed image is recognized by the application, various digital media would display over the image on the device's display. In many cases the digital media had some amount of interactive like links to external websites, social media feeds, and other simple interactive elements. The pre-programmed images that could be scanned by the application would be posters of event partners and speakers, also event logos and sponsor pamphlets. The application would display links to speaker social profiles, videos of past speakers, and links to twitter feeds and message boards for participant interaction.



Figure 3. Augmented reality application viewing printed event information.

The smartphone application was considered the main activity because it had taken the most hours of preparation and could be used by any and all participants with compatible devices. A few other activities were implemented to both draw interest to the use of the application and to scaffold the use of it to reduce cognitive load. One of these activities was an augmented reality booth that had PCs loaded with AR software connected to high-definition webcams and large displays. This made it possible for passers-by to experience a simple version of the same type of augmented reality used in the application. Volunteers asked participants to present their program booklets to the camera and event logos displayed in real time. This allowed participants to see what AR can do and also allow them to practice with the spacing and positioning needed to use the software properly. In an added merit to the event goals, screenshots of participants with the digital AR content were taken and curated onto social media feeds so they can be seen and distributed freely.

The different levels of technology acceptance demanded not just some low tech scaffolding, but no tech activities that could be used. That is why a simple pen and paper reflection activity was created next to an AR booth where participants wrote simple messages and they could be scanned into the computer to be augmented with the application. There were volunteers at this station to explain how it connected to the other AR activities and invited participants to try it.

With these three activities all levels of technical skill and acceptance could have a path to full mastery of the application given a short amount of time and cut down on

confusion and cognitive overload. See Table 1 for a see a reference on how the activities were used to scaffold into participants' AR mastery to use the smartphone application.

Table 1: Scaffolding to AR mastery

Technical Skill Level	Activity	Scaffolding to AR mastery
Low	Message from the past (pen and paper)	Demonstration by a volunteer (hear about AR)
Medium	AR photo booth (no download required)	Practice using AR without the use of a mobile device (Experience AR)
High	AR application (download required)	Exploration of venue with AR mobile application (Participate with AR)

Instrumentation

Data was collected from each activity to analyze participant turnout. This allowed the comparison of each activity and how the participants progressed from one to another. Volunteers were at every activity and they recounted observations of participant interest. Each activity had a different way to collect data on its usage. See Table 2 for a breakdown of the main instrumentation of each activity.

Table 2: Activity Instrumentation

Activity	Participant count method	Supplemental Data
Message from the past (pen and paper)	Physical card count	Observations, volunteer notes
AR photo booth (no download required)	Screenshot count	Social media data, observations, volunteer notes
AR application (download required)	Google Analytics Unique device count	AR trigger information, Usage time, Timestamps, Social media data

Observations and Results

Overall the participants and volunteers enjoyed all of the activities. There were many surprised and smiling faces observed from first time users of the AR photo booth and the AR application. For each level of technical skill there was a decline in participation. There were 312 messages from the past cards written, 107 screenshots taken and curated, and 45 unique devices accessed at least one of the AR enhanced media.

Conclusions

AR has multiple affordances for increased engagement at conferences and events (Zurzuola et al. 2013; Guttentag, 2010). There are also several challenges to face in successfully implementing AR and creating a design that properly aligns to the event goals. One of those challenges known to using AR for first time users is cognitive overload (Dunleavy, 2014) and introducing some simple ways to show how to use AR before using in a task helps that problem (Mayer & Moreno, 2003).

The activities designed in the experiment anecdotally helped participants and reduce cognitive overload for first time users of AR. But the user data showed a negative correlation between the needed technological skill and the number of participants in that activity. This suggests that there is a barrier of first time use of AR but the results don't suggest a reason why.

How AR can be used and implemented is heavily reliant on the available technology and the prior experience (Dunleavy, 2014). So when considering a design approach for implementing AR based activities for events and conferences, the two main considerations should be learning goals and available technology. The third main consideration is audience technology skill and acceptance level, but a deficiency in this area can be helped at least in part with proper design of the activity and a multi-level introductory approach.

The Next Iteration

The next iteration of these activities or this experiment could benefit from improvements in design and advancements in mobile technology. One major hurdle to use the AR application was the need to download a lot of data. Storage on mobile devices and bandwidth at the event were at a premium. Perhaps a step between medium and high technological skill could be implemented by preloading the application on tablet devices that could be used in the close vicinity of the AR booth to test using it with having to download the application on participants' personal devices.

These AR activities would be enhanced with the use of heads-up-displays (HUDs) instead of smartphones and tablets. The always on passive scanning of the particular AR application that was used in this experiment would be well suited to the use of HUDs like Google Glass. Participants would not have to hold up their mobile devices for long periods of time in sometimes awkward positions. However a test was run with this application on Google Glass and it was found that it lacks the processing power to give any acceptable amount of responsiveness.

Future Research

A comparison of similar studies could help determine how AR technology usage is progressing into the mainstream. If the same AR application could be tested with the same group over several sessions, the results might help determine how helpful the initial learning about AR before given a task is correlated to cognitive overload.

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Contact Email: <http://erichawkinson.com>

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The International Academic Forum (IAFOR)
Sakae 1-16-26-201
Naka Ward, Nagoya, Aichi
Japan 460-0008
www.iafor.org