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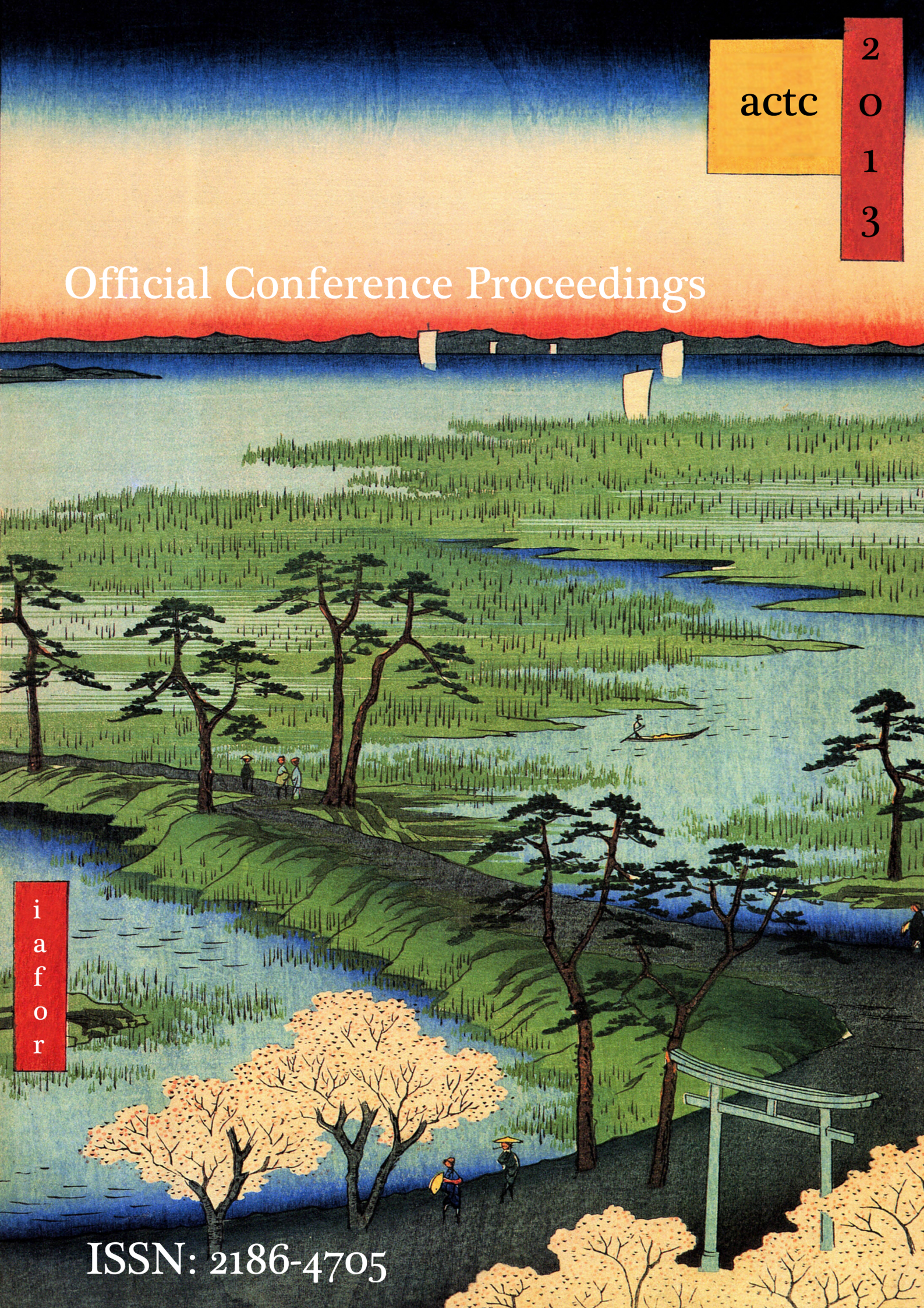

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The Perception of ODL Students towards the Use of Social Media Networking Systems

Jan Wiid, Michael Colin Cant, Corinne Nell

University of South Africa (UNISA), South Africa

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Abstract

Social media has completely changed the way in which people communicate and share information. Social media is also an excellent manner in building businesses, relationships and connecting with other people around the world. Due to the growth in social media platforms and the increase in the use and access to social media, this study investigated students' perceptions regarding the use of social media networking systems during their time of study at an Open Distance Learning (ODL) tertiary institution. The study also investigated the attitude students have towards the ease of social media systems and whether they believe it will be an effective and easy way of obtaining and studying course content. In order to establish the ease of working with social media systems, the Technology Acceptance Model (TAM) was implemented by making use of the six technology constructs. In order to achieve the objectives of the study, a survey was distributed to 221 students that have previously attended a tutorial class in order to assure that they are familiar with the procedures, tutors and related course work. It was found that students perceive the ease of use as being the most important factor to consider when they are using social media systems.
Keywords: *ODL, social media, social media networking systems, teaching, education, TAM.*

1. Introduction and Objectives

The use of internet-based social networking systems have enabled companies, consumers, institutions and many more to communicate with hundreds, even thousands of other people around the world about a specific topic, product or issue at any point in time (Mangold & Faulds, 2009:357). Social media systems therefore do not only make it easier for companies to communicate with their consumers, but also makes it easier for tertiary institutions to communicate related course work to their students, to encourage discussion between and among students and to address administrative issues (Moran, Seaman & Tinti-Kane, 2011:4; Adamson, 2012). Shen, Laffey, Lin and Huang (2006:270) further indicated that online learning through means of various social media systems has become a very common educational format to use, by both tertiary institutions and their students around the world, due to its flexibility of time and place. Social media systems therefore have the ability to enable teachers and students to collaborate and share information at any time convenient to them (Adamson, 2012).

Hobbs (2004:42) stated that the moment when teachers in a tertiary institution make use of online videos, clips, web sites, newspapers and/or magazines in teaching relevant course work or when they involve students in creating media productions through using video cameras, smart phones or computers, it may motivate the student's interest in the subject, create better and more effective communication, as well as develop critical-thinking, personal and social skills. Adamson (2012) further stated that although social media systems might change the focus of education from a single student to a group of students, students' individual learning experience is enhanced through collaboration and informal learning with their peers. However, Picardo (2011:1) indicated that the use of social media systems in the tertiary institution can lead to a loss of control for many teachers as they experience social media systems as being highly disruptive. The reason for this might be that students are more familiar with using different social media tools whereas teachers might not be and they therefore feel that they will not be able to control students online (Picardo, 2011:1).

King, Duke-Williams and Mottershead (in Picardo, 2011) indicated that the main reason some teachers in tertiary institutions resist against the adoption of social media systems is due to their lack of knowledge thereof, as well as the little part that it plays in both their professional and personal lives. Therefore, the challenges that are faced by some tertiary institutional teachers would be to develop new teaching and learning strategies that integrate the use of social media systems, which will allow them to focus on learner-centred strategies, rather on the traditional teacher-centeredness strategies.

Previous research that was done by Moran *et al.* (2011:4) indicated that almost all tertiary institutions are aware of social media sites and more than 75% visited a social media site within the past month for their personal use and almost 50% posted some form of content. Ninety percent of tertiary institutions are using social media in courses they're teaching or for their professional careers outside the class room (Lepi, 2012:2). The purpose of this study however is to determine students' perceptions on the use of social media networking systems during their time of study at an open distance learning (ODL) tertiary institution. Therefore, the objectives are as follow:

- To determine the perception of students' on the effectivity of social media as a lecturing tool.
- To determine the utilisation of social media by students.
- To investigate the relationship between social media as a lecturing tool and the private use of social media by students.

The following section reviews the scope of social media, as well as the different types of social media systems and the influence thereof on students. The empirical findings and the discussion of the findings appear in the latter part of the paper.

2. Overview of social media

To some, the term social media seems like a new phenomenon, however it is not. Social media already started in the late sixties, early seventies (Borges, 2012:2). Since the introduction of social media systems, thousands, even millions of users have been attracted, many of whom have integrated these systems into their daily, personal and professional lives (Boyd & Ellison, 2008:210). The term social media is defined by Boyd and Ellison (2008:211) as "... web-based services that allow individuals to construct a public or a semi-public profile within a bounded system, articulate a list of other users with whom they share a connection and view and traverse their list of connections and those made by others within the system". Mangold and Faulds (2009:357) further defined social media, also known as 'consumer-generated media', as "... a variety of new sources of online information that are created, initiated, circulated and used by consumers intent on educating each other about products, brands, services, personalities and issues".

Social media consists of a number of online, word-of-mouth forums which include; blogs, company-sponsored discussion boards and chat rooms, consumer-to-consumer email, consumer-product or service rating websites and forums, Internet discussion boards and forums, moblogs (sites containing digital audio, images, movies, or photographs), and social networking websites, only to name a few (Mangold & Faulds, 2009:358). The main technological features among these social media systems are more or less the same; however the cultural image that is build around each social media system differs. A number of social media systems support the maintenance of pre-developed social networks, however others help strangers to connect based on mutual interests, religious or political views or activities. Several social media systems cater to different viewers, whilst others attract people based on their language or mutual, religious, racial, sexual or nationality based identities. Social media systems also differ in the degree to which they integrate new information and communication tools, such as mobile connectivity, blogging, and photo and video sharing (Boyd & Ellison, 2008:210).

According to Larson (2012), the five most popular social media systems are firstly Facebook with 901 million users, second is Twitter with 555 million users, third is Google+ with 170 million users, fourth is LinkedIn with 150 million users and lastly is Pinterest with 11.7 million users. These users can further be broken down into the following estimated age categories as summarised in Table 1 (Larson, 2012).

Table 1: Estimated users age

	Estimate User Age					
Social Media Type	**13-17**	**18-25**	**26-34**	**35-44**	**45-54**	**55+**
Facebook	11%	29%	23%	18%	12%	7%
Twitter	4%	13%	30%	27%	17%	9%
Google+	9%	23%	35%	15%	11%	7%
LinkedIn	0%	18.1%	31.2%	24.8%	15%	10.5%
Pinterest	3%	6%	28%	28%	25%	11%

From the table above it is clear that people are aware of social media systems and that they use these systems in some or other way, for either personal or professional purposes. The use and benefits of social media systems are discussed next.

The use and benefits of social media systems

Jackson (2011) indicated that the use of social media websites in classrooms can have a positive psychological effect on students. He further found that the moment when students are allowed to answer questions by using for example Twitter, they felt less pressured even though the answer is wrong. Social media enabled teachers to manage social concerns and to develop a safe learning environment where everybody has the ability to teach (Jackson, 2011).

Table 2 summarises the ways in which social media systems can be implemented in teaching, as well as the benefits thereof.

Table 2: Uses and benefits of social media systems

Type of Social Media System	**Description of use and benefits**
Facebook	• Improve communication by enabling students to easily message teachers and other students with questions • Easily integrate class projects with facebook through the sharing of books, reviews and promoting student work • Use facebook applications and groups in order to make learning and studying easier and more enjoyable for students • Create a Facebook page where you can schedule events, post notes and remind students of important dates and due dates • Be a news source by posting status updates and follow other media and well-known leaders
Twitter	• Post additional materials such as links to articles and videos in order for students to continue with their learning even if classes are over • Setting-up specific feeds to enable all students to see and monitor certain events • Develop a feed for your students in order to tweet about important dates, upcoming events and assignments as well as class news

	• Connect with other students, teachers as well as parents in order to increase communication and build community • Follow tweets of other educators' in order to keep up with the latest teaching trends, to get ideas and to support one another • Share ideas and collaborate with teachers and students from other classes, schools and departments
Pinterest	• Use community boards for group projects as well as brainstorming to enable a number of users to save their resources in one place • Allow and encourage students to use Pinterest for presentations and projects • Search for inspiring tips on how to organise and decorate your classroom • Search, find, pin and organise images, projects, videos, stories etc for future classes and projects
YouTube	• Search for video-clips under specific topics that can be used in the classroom to give a lesson in a more memorable way • Organise playlists to enable students to easily find and watch all relevant and approved videos on a topic • Record lessons and post them on YouTube in order for students to review them whenever they want to • Create interactive videos by adding quizzes, comments etc to it

Source: Lepi, K. (2012).

Although tertiary institutions might be aware of the different uses and benefits of social media, it is still important to get the students' perception on using social media systems in their tuition. According to Picardo (2011) students perceptions and use of technology may also play a part in the absence of social media in schools. A question still stands, 'Do students wish to interact with their teachers online'? The answer to this question may be more complex than it initially appears to be, as the participation of students in a network should be voluntary in order to ensure that the necessary quality of interaction and cooperation is obtained, in order to improve teaching and learning. However, a problem can arise if a number of students decide not to participate in either a school-managed learning environment or in a personal learning network (Picardo, 2011).

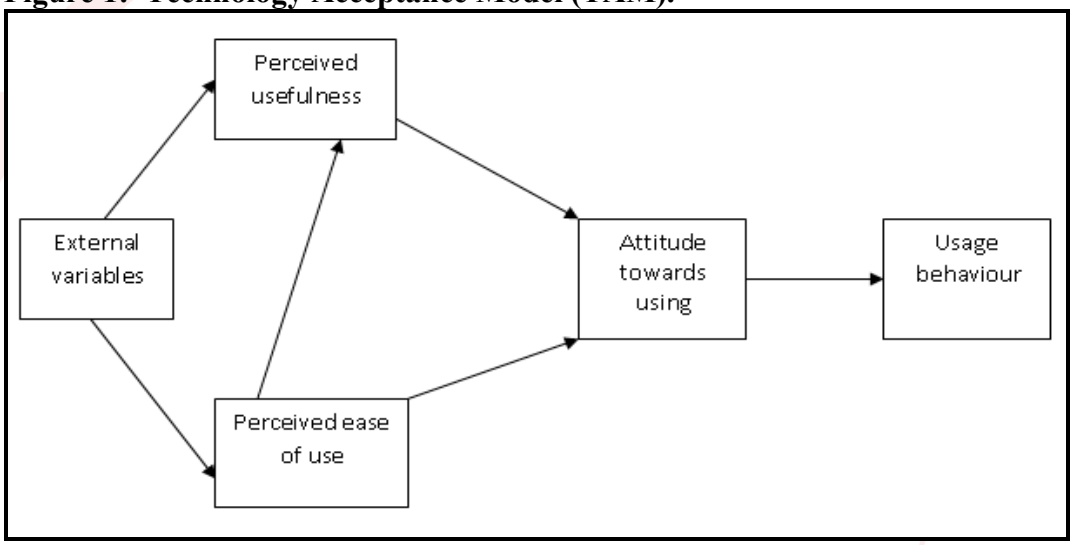
Picardo (2011) further argues that social networks challenge the ability of both teachers and students to interact and collaborate successfully via this medium, meaning that when it comes to academia, students don't feel comfortable with the degree of transparency needed in order for the network to be effective. Picardo (2011) further indicated that the distinction between work and play is seen as a major obstacle by both the students and the teachers and it may play a negative role in the student's perception of the usefulness of social networks in the educational context.

In order to determine the students' perceptions on the use of social media systems in tertiary institutions (higher education), the five constructs of the Technology Acceptance Model was studied. These are discussed in the next section.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is an information system (a system that consists of all the network communication channels used within an organisation) theory that demonstrates how users accept and use specific technology (Davis 1993:475). The model indicates that when users are confronted with a new software package, various factors influence their decision about how and when they will use this specific technology (Mazhar, 2006). Davis, Bagozzi and Warshaw (1989:985) indicated that user motivation can be explained by three constructs, namely; *Perceived Ease of Use*, *Perceived Usefulness,* and *Attitude Toward Using the System*. Figure 1 below represents the TAM constructs and it is discussed thereafter.

Figure 1: Technology Acceptance Model (TAM).



Source: Adapted from Davis, Bagozzi & Warshaw (1989:985)

The first construct is *Perceived usefulness* (PU), which is described according to Davis (1993:477) as "... the degree to which an individual believes that using a particular system would enhance his or her job performance". The second construct which is *Perceived ease-of-use* (PEOU) is defined as "... the degree to which an individual believes that using a particular system would be free from effort" (Davis, 1993:477). The third construct of the TAM is *Attitude towards using* and is defined as "... the degree of evaluative affect that an individual associates with using the target the target system in his or her job" (Davis, 1993:476). The fourth construct that was tested was *Subjective norm* which is defined by Venkatesh and Davis (2000:187) as a "... person's perception that most people who are important to him think he should or should not perform the behaviour in question". The last construct that was being tested was that of *System accessibility* which refers to organisational context variables. Park (2009:153) indicated that the organisational context can affect both the perceived usefulness as well as the perceived-ease-of-use.

According to Mazhar (2006) the main goal of TAM is "to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified". TAM indicates that if a user perceives a specific technology as being useful, they will believe in a positive user-performance relationship. As effort is a

limited resource, a user is most likely to accept an application when they perceive it as being easier to use than another.

As an end result, educational technology that has a high level of PU and PEOU is probably going to encourage a positive perception. The relationship that exists between PU and PEOU is that PU arbitrates the effect of PEOU on both attitude and future uses. This simply means that while PU has a direct impact on attitude and use, PEOU has an indirect influence on attitude and use through PU.

3. Research Methodology

In determining the perceptions of students on social media, a questionnaire was developed for this study. The questionnaire mostly incorporated questions that are of quantitative nature. The questionnaire was issued to students/tutors in the CEMS College of the University of South Africa. The final number of students/tutors included in the population for the distribution of the questionnaire, was 221 from classroom situations.

The demographic profile of the respondent group is presented in Table 3. The majority of students (29.80%) were between 18 and 24 years of age. The gender split of the respondent group is female dominated, with 63% of the students being female. Most of the respondents are African (62.63%).

Table 3: Demographic profile

Q15: Age group	**% of Total**	**N**
18-24	29.80%	59
25-29	25.25%	50
30-34	17.68%	35
35-39	15.66%	31
40+	11.62%	23
Q16: Gender		
Male	37.00%	74
Female	63.00%	126
Q17: Race		
African	62.63%	119
Coloured	18.95%	36
Indian	4.74%	9
White	13.68%	26

4. Results

Perceptions of students on social media as a lecturing tool

To determine the perceptions of students of social media, respondents were asked to rate 21 statements on a seven point Likert scale (1 being "Strongly disagree" and 7 being "Strongly agree").

The 21 statements are structured as 5 sub-constructs:

- Perceived ease of use: statements 1 to 5
- Perceived usefulness: statements 6 to 10
- Attitude towards using: statements 11 to 15
- Intention to use: statements 16 to 20
- System accessibility: statement 21

Table 4 represents the first construct- Perceived ease of use.

Table 4: Perceived ease of use

		Strongly Disagree	2	3	4	5	6	Strongly Agree	Mean
		% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	
1	Social network systems is easy to use	12.89%	6.19%	7.22%	10.82%	8.76%	13.40%	40.72%	4.99
2	Easy learning to use social network systems	11.34%	4.64%	7.22%	11.86%	9.28%	15.98%	39.69%	5.10
3	Interaction with social network systems is clear and understandable	10.94%	6.25%	6.77%	14.58%	10.42%	17.19%	33.85%	4.94
4	Easy to find information on social network systems	10.42%	8.33%	4.17%	14.06%	13.54%	17.19%	32.29%	4.93
5	Easy to become skilful at using social network systems	8.81%	7.77%	5.18%	15.03%	16.58%	13.99%	32.64%	4.95

Most respondents agreed or strongly agreed with the statements by marking 5, 6 or 7, this is also shown by the averages varying from 4.93 to 5.10, although few respondents strongly disagreed. All the measurements of 'Perceived ease of use' were agreed upon by the respondents. Considering the averages (for ranking purposes) the most agreed upon item is 'Learning to use social networking systems would be easy for me'.

The following share chart produces a visual representation of the responses with red agreeing and blue disagreeing.

Figure 2: Perceived ease of use responses

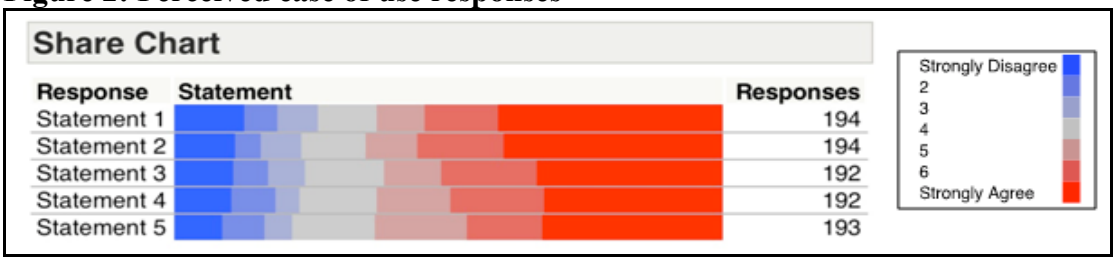


Table 5 represents the second construct – Perceived usefulness.

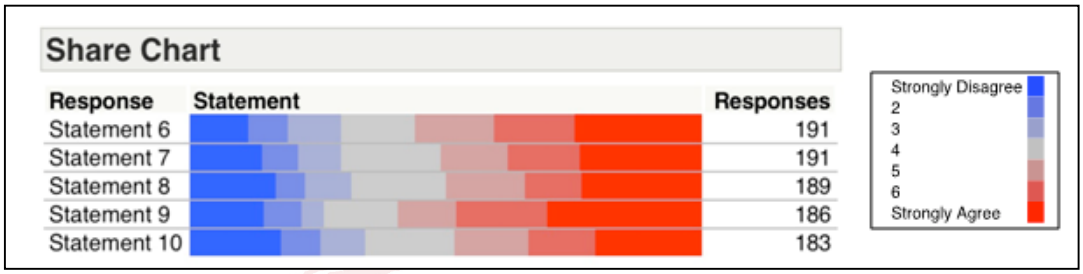
Table 5: Perceived usefulness

		Strongly Disagree	2	3	4	5	6	Strongly Agree	Mean
		% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	
6	Using social network systems would enhance effectiveness in teaching	11.52%	7.85%	10.47%	14.14%	15.71%	15.71%	24.61%	4.60
7	Using social network systems would improve course performance	14.14%	7.33%	8.38%	19.37%	13.09%	14.14%	23.56%	4.47
8	Using social network systems would increase my productivity in my teaching work	16.93%	5.82%	8.99%	18.52%	15.34%	11.11%	23.28%	4.36
9	I found social network systems useful	14.52%	7.53%	4.30%	14.52%	11.29%	17.74%	30.11%	4.74
10	Social network systems could make it easier to study course content	18.03%	7.65%	8.74%	17.49%	14.21%	13.11%	20.77%	4.25

Most respondents agreed with the statements by marking 5, 6 or 7, this is also shown by the averages varying from 4.25 to 4.74, although some respondents strongly disagreed. The respondents agreed upon all the measurements of 'Perceived usefulness'. Considering the averages (for ranking purposes) the most agreed upon item is 'I found social network systems useful', while the item 'Social network systems could make it easier to study course content' were least agreed upon.

The following share chart produces a visual representation of the responses with red agreeing and blue disagreeing.

Figure 3: Perceived usefulness responses



The following share chart produces a visual representation of the responses with red agreeing and blue disagreeing.

Table 6 represents the third construct – Attitude towards using social media.

Table 6: Attitude towards using social media

		Strongly Disagree	2	3	4	5	6	Strongly Agree	Mean
		% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	
11	Disliking the idea of using social network systems	16.40 %	8.99%	5.82%	10.05%	10.05%	12.70%	35.98%	4.70
12	Favourable attitude towards using social network systems	18.92 %	5.95%	7.03%	18.38%	14.05%	13.51%	22.16%	4.32
13	Good idea to use social network systems for teaching	17.84 %	9.19%	6.49%	15.14%	14.59%	12.43%	24.32%	4.34
14	Using social network systems is a foolish idea	12.23 %	4.79%	3.19%	11.17%	11.70%	9.04%	47.87%	5.24
15	Positive towards social network systems	17.74 %	4.30%	7.53%	10.22%	15.59%	16.67%	27.96%	4.63

Most respondents agreed with the statements by marking 5, 6 or 7, this is also shown by the averages varying from 4.32 to 5.24, although some respondents strongly disagreed. The respondents agreed upon all the measurements of 'Attitude towards social media use'. Considering the averages (for ranking purposes) the most agreed upon item is 'Using social network systems is (NOT) a foolish idea', while the item 'I have a generally favourable attitude towards using social network systems' were least agreed upon.

The following share chart produces a visual representation of the responses with red agreeing and blue disagreeing.

Figure 4: Attitude towards using social media responses

Table 7 below represents the fourth construct – Intention to use social media.

Table 7: Intention to use social media

		Strongly Disagree	2	3	4	5	6	Strongly Agree	Mean
		% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	
16	Intend to use social network systems for teaching purposes	18.18%	6.42%	7.49%	19.25%	12.83%	14.44%	21.39%	4.31
17	Often return to social network systems	15.76%	4.89%	8.70%	20.65%	10.87%	10.87%	28.26%	4.52
18	Intend to visit social network systems frequently for teaching work	15.96%	5.32%	9.04%	13.83%	16.49%	14.89%	24.47%	4.52
19	Intend to be a heavy user of social network systems	18.52%	6.88%	12.17%	17.46%	12.70%	11.11%	21.16%	4.17
20	Intend to use social network systems for communication	13.37%	6.95%	7.49%	11.23%	14.97%	9.63%	36.36%	4.82

Most respondents agreed with the statements by marking 5, 6 or 7, this is also shown by the averages varying from 4.17 to 4.82, although some respondents strongly disagreed. All the measurements of 'Intention to use' were agreed upon by the respondents. Considering the averages (for ranking purposes) the most agreed upon item is 'I intend to use social network systems for communicating with others', while the item 'I intend to be a heavy user of social network systems' were least agreed upon.

The following share chart produces a visual representation of the responses with red agreeing and blue disagreeing.

Figure 5: Intention to use social media

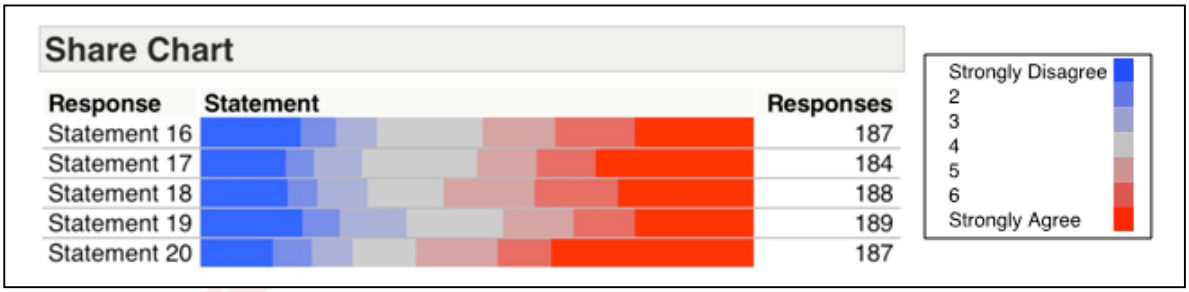


Table 8 represents the fifth construct – System accessibility.

Table 8: System accessibility

		Strongly Disagree	2	3	4	5	6	Strongly Agree
		% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total
21	No difficulty accessing and using an e-learning system	12.50 %	5.43%	8.15%	10.33%	15.22%	14.67%	33.70%

Most respondents agreed with the statement 'I have no difficulty accessing and using an e-learning system in the university' by marking 5, 6 or 7. The average for ranking purposes is 4.89.

Reliability of the sub-constructs

Reliability is the consistency of the measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. A Cronbach's alpha value above 0.8 has very good reliability, a value between 0.6 and 0.8 has acceptable reliability and a value below 0.6 has an unacceptable reliability. The Cronbach's alpha for the 5 sub-constructs all yielded high Cronbach's alpha values (≥0.80) indicating good reliability. Table 9 below represents the Cronbach's alpha values of each of the 5 sub-constructs, please note that 'Accessibility' is only one item and cannot be tested for reliability.

Table 9: Cronbach's alpha

Sub-construct	Questions	Cronbach 's alpha
Q13 Ease of use score	Statements 1 to 5	0.92
Q13 Usefulness score	Statements 6 to 10	0.92
Q13 Attitude score	Statements 11 to 15	0.80
Q13 Intention score	Statements 16 to 20	0.91
Q13 Accessibility score	Statement 21	None

The individual Cronbach's Coefficient Alpha value of each dimension is used as a measure of the reliability of the tested dimension. A reliable Cronbach's Coefficient Alpha value validates that the individual items of a dimension measured the same dimension (concept) in the same manner (or consistently). For each sub-construct a mean was calculated to assess the level of agreement among the sub-constructs. Table 10 shows the means and standard deviations.

Table 10: Means and standard deviation

Sub-construct	Mean	Std Dev
Q13 Ease of use score	4.98	1.80
Q13 Usefulness score	4.50	1.84
Q13 Attitude score	4.64	1.65
Q13 Intention score	4.44	1.84
Q13 Accessibility score	4.89	2.10

The sub-construct 'Ease of use' was considered most important with a mean of 4.98, while 'Intention' was least important with a mean of 4.44. The means were closely distributed indicating a general agreement on the importance of all the sub-constructs; however this agreement was not strong.

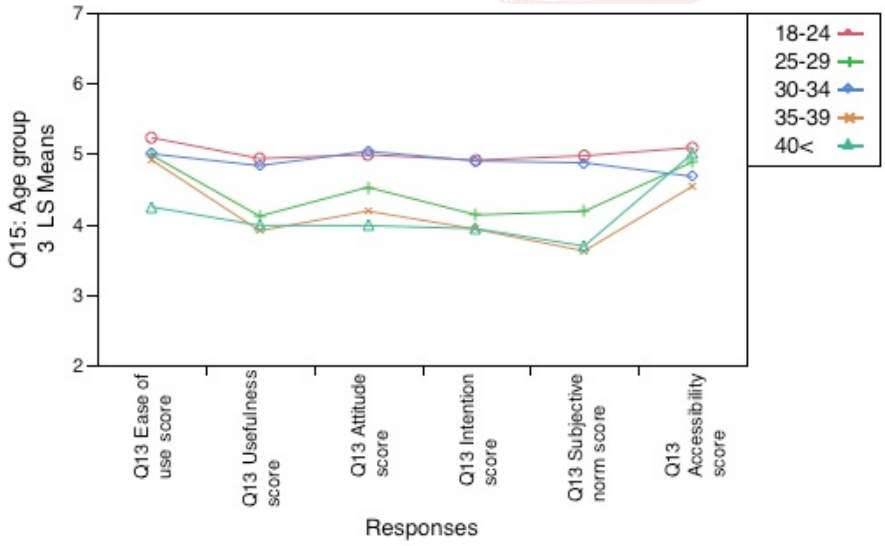
The standard deviations are fairly high indicating variation in agreement among sub-constructs.

Comparison of the respondents views on the six sub-constructs of social media use amongst age groups

A profile plot from the Multivariate Analysis of Variance (MANOVA) will be used in order to explore differences between the sub-constructs' mean score's of students of different age groups.

The profile plots from the MANOVA shows the least square means.

Figure 6: Students of different age groups on six social media sub-constructs



From the figure it is clear that there is a difference between some of the age groups. The age-groups 18-24 years and 30-34 years seemed to view the sub-constructs of social media more important than the rest of the age-groups.

In order to develop a profile of the different age groups, the following descriptive statistics, as observed from the table below, should be taken into consideration.

Table 11: Descriptive statistics of age groups

Age group	Ease of use score	Usefulness score	Attitude score	Intention score	Accessibility score
18-24	5.23	4.93	4.99	4.91	5.09
25-29	4.98	4.11	4.52	4.13	4.88
30-34	5.00	4.83	5.04	4.90	4.68
35-39	4.91	3.91	4.19	3.93	4.54
40+	4.25	3.98	3.98	3.94	5.00

From the figure it is clear that the 18-24 years and 30-34 years age groups have higher scores on 'Usefulness' (4.93 and 4.83), 'Attitude' (4.99 and 5.04) and 'Intention' (4.91 and 4.90) than the other age groups.
In order to determine whether these differences between the means of the age-groups are statistically significant, separate Analysis of Variance (ANOVA) were conducted for each sub-construct. The distributions of the constructs were tested for normality. Because the sub-constructs were not normally distributed nonparametric Kruskall Wallis tests was used instead of ANOVA.

From the Kruskall Wallis analyses probability values (p-values) were produced. A 'p-value' smaller than 0.05 indicates a significant difference between the means of the dimension tested for the spectator groups at a 95% level of confidence.

Only significant differences are shown in table 12.

Table 12: Significant differences

Sub-construct	Chi-Square value	DF	P-value	Significance
Usefulness	10.36	4	0.0348	Significant
Attitude	9.79	4	0.0442	Significant
Intention to use	9.09	4	0.0589	Borderline case

Significant differences between the age-groups exist for the sub-constructs 'Usefulness' and 'Attitude' at a 95% level of confidence, while 'Intention to use' is significant at a 90% level of confidence.

5. Conclusion

It was found that the most important factors according to the students perceptions on the effectivity of social media as a lecturing tool was 'Ease of use' and 'Accessibility'.

On 'Usefulness' respondents agreed most with 'I found social network systems useful', but they've agreed the least with 'Social network systems could make it easier to study course content'. With regards to 'Attitude' the respondents agreed most with 'Using social network systems is (NOT) a foolish idea', but they've agreed the least with 'I have a generally favourable attitude towards using social network systems'. On 'Intention to use' respondents agreed most with 'I intend to use social network systems for communicating with others', but agreed least with 'I intend to be a heavy user of social network systems'.

There was no biographical differences use, except for age-groups. The age-group 18-24 considered all the constructs as more important than the other age-groups, while the age-group 30-35 considered 'Usefulness', 'Attitude' and 'Intention' more important than the other age-groups.

6. Recommendations

This study focused on six technology acceptance constructs in order to determine the students' perceptions on the use of social media networking systems. With regards to findings that were obtained, the following recommendations have been made:

- It is important that tertiary institutions ensure that the type of social media system used is easy to use, as well as accessible.
- It was found that younger age groups generally put more focus on the use of social media, while students that do not use social media put less emphasis on social media. It is therefore recommended that the students should be educated on the importance of social media.
- It is interesting to note that, although students find social media useful, they are not convinced that it will help with learning. Although students think social media systems are a good idea, they do not see it as favourable. Although students intend to use social media systems, they do not intend to be heavy users of it.
- It can be recommended that tertiary institutions should make social media systems more 'attractive' to students.

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The Development of Web-Based Instruction on Research Proposal for Undergraduate Students at RMUTL

Sirichom Pichedboonkiat

Rajamangala University of Technology Lanna, Thailand

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Abstract

This action research aimed to study 1) the lesson effectiveness of Web-Based Instruction of Research Methodology subject with title "Research Proposal", 2) the learning achievement of Research Methodology subject with title "Research Proposal" of undergraduate students who learned by using the Web-Based Instruction Lesson, and 3) the achievement comparative of among undergraduate students between before and after learning by using Web-Based Instruction Lesson in Research Methodology subject with title "Research Proposal". The population student was 100 undergraduate students who registered the Research Methodology subject in the first semester year 2011. The instrument of this study was Web-Based Instruction Lesson, test, and questionnaires. Descriptive and inferential statistics, such as frequency, percentage, mean, standard deviation, and t-test were used in analyzing the data.
The result of this study found that:

1) The lesson effectiveness of Web-Based Instruction Lesson was 90.01/93.68

2) The before learning achievement of the undergraduate students was a lower than the standard of learning achievement (μ = 27.32), and the after learning achievement of the undergraduate students was higher than the standard of learning achievement. (μ = 65.58). For the learning achievement comparative between before and after learning of the undergraduate students found that the after learning was higher than before learning which is significantly different at .01

3) The satisfaction of the undergraduate students who learned by using a Web-Based Instruction Lesson is satisfied at a much level. (μ = 4.00)

Keyword: *Web-Based Instruction Lesson, Research Methodology, Research Proposal, Undergraduate Students, RMUTL*

1. Introduction

Education in nowadays focuses on skillful learners who is able to apply the knowledge obtained in their everyday life. Human resources development is important for developing country. Education is a tool for human developing. There are many factors concerned developing which the most significant factor is human resources. There would not be a complete development unless a fine quality of the human resources. Technology and network are required for human developing such as teaching by using computer. Individual learns differently based on his or her environment, characteristics, and emotion. The systematic knowledge transferring in the classroom and in everyday life help the learners to learn according to their group that have similar learning method as learning process (Craik and Lockhart 1972, cited in Pratchajanan Ninsuk, 2000, p-48-52) proposed that learning process consists of many steps. We can learn and remember any meaningful knowledge rather than motivated learning. Learning process contains many steps and focuses on learning through computer that can access information. The usage of computer by using internet for lesson developing is to set teaching and learning environment that apply internet features in World Wide Web for creating learning styles such as references, learning documents, lessons, curriculum because World Wide Web contains information resources such as letters, pictures, animation, or sound by using hyperlink both hypertext and hypermedia for information linkage. The usage of information technology for self learning focuses on individual which is not knowledge transferring only by the teacher but also knowledge obtained from variety learning styles and environment. Information technology is helpful for learners because of the dynamic information which the lesson is flexible that can either change or develop. Thus, web based instruction lesson is the information resource which is interesting as future trend. It can be developed as digital or digital convergence. Many schools and universities use web based instruction in teaching with hypermedia that learners can study by themselves. Learners can choose lesson with multimedia and sound with suitable timing also create human to human interaction.(Chai-yot Rueangsuwan, 2003, p. 131). Nowadays, teachers have to use variety teaching styles for preventing and improving inappropriate behave of the students. This can be found in the curriculum of the primary school, secondary school, and high school. So the students know and can use it properly. Therefore the instruction media can be used to help learners to learn effectively. It provides learning environment that help learner as John Dewey stated that the effective learning is learning by doing and individual learning.

The researcher developed web based instruction lesson for research proposal in research methodology subject for effectively teaching and learning and to help students to learn better because this subject is new and difficult. This subject is for graduate students which contains less students that creates effective teaching and learning. To teach this subject, the teacher have to use variety of teaching styles and instruction media because of the large number of students and most students do not know how to write research proposal, select the population and sample. The students can do random sample and random size but they cannot do that when they actually do research. From the reason mentioned above, the researcher who works as a teacher realized the usage of technology information in teaching so that the students can learn anytime and anywhere. Also focuses on student centered which students can learn better and live happily in the society.

2. Objective

1. The lesson effectiveness of web based instruction of research methodology subject with title 'Research Proposal'

2. The learning achievement of Research Methodology subject with title 'Research Proposal' of undergraduate students who learned by using web based instruction lesson

3. The achievement comparative of among undergraduate students between before and after learning by using web based instruction lesson in research methodology subject with title 'Research Proposal'

Research framework

Research framework of the development of web based instruction on research proposal for undergraduate students at RMUTL focuses on student learning on how to write research proposal in Research Methodology subject also motivated student learning according to their aptitude and interest that can be applied for their future career

Hypothesis

1. The lesson effectiveness of web based instruction of research methodology subject with title 'Research Proposal' is 80/80.

2. The learning achievement of Research Methodology subject with title 'Research Proposal' of undergraduate students who learned by using web based instruction lesson after learning is higher than before learning with significantly different at .01

3. The satisfaction of the students who learned by using a web based instruction with title 'Research Proposal' is satisfied at a much level.

3. Research methodology

The research 'The development of web based instruction on research proposal for undergraduate students at RMUTL' is a quasi experimental research the pre-test, post-test, randomized group design is as follows:

Sample	Pretest	Treatment	Posttest
S_1	O_1	X_1	O_2

S_1 = undergraduate students
O_1 = Pretest
X_1 = the study of web based instruction on research proposal
O_2 = Posttest

Population

Population is 100 undergraduate students who enrolled the subject 'Research Methodology', first semester on 2011

Variable

Independent variable is the undergraduate students who study by using web based instruction on research proposal

Dependent variable

1. The achievement of the undergraduate students who study by using web based instruction on research proposal, first semester on 2011.

2. The satisfaction of the undergraduate students for the web based instruction on research proposal

Content of the study

There are seven units which are

Unit 1 Introduction
Unit 2 Objective and Hypothesis
Unit 3 Scope and Variable
Unit 4 Key words and Benefits
Unit 5 Literature review
Unit 6 Research methodology
Unit 7 Bibliography and references

Research Tools

There are four types of research tools which were developed by the researcher

1. Web based instruction on research proposal
2. Achievement test before and after using web based instruction on research proposal
3. Exercises for web based instruction on research proposal consisting of seven units
4. Questionnaire for satisfaction of web based instruction on research proposal

Collecting data tools are:

1. Computer assisted instruction. It is web based instruction on research proposal which was developed from Adobe Dream Weaver. It presents teaching activities and description of letters and animated characters.

2. Achievement test before and after study

The test is multiple choices with four choices. It contains seven units for seventy items. Each item is one point.

3. Achievement test while studying

The test is multiple choices with four choices. It contains seven units for seventy items. Each item is one point.

4. The satisfaction of the undergraduates who enrolled the subject 'Research Methodology', first semester on 2011 for the web based instruction on research proposal. There are 15 items which is rating scale of Likert, 1967 with five scales:

Most satisfaction	=	5 points
Much Satisfaction	=	4 points
Moderate satisfaction	=	3 points
Less satisfaction	=	2 points
Least satisfaction	=	1 points

Research tool preparation

The preparation of web based instruction on research proposal is below:

1. Study course outline, objective, and how to produce the tools from 'Research Methodology' on Research proposal based on the curriculum of Rajamangala University of Technology, Lanna, 2005

2. Study web based instruction and relevant researches as well as computer assisted instruction for accurate information

3. Create 100 items of standard test for study achievement to test for simply and difficulty (p) and classification (r). The test is selected for 70 items by p is between 0.20 and 0.80 and r is more than 0.20. This test is use before and after study.

4. Study web based instruction by using Adobe Dream Weaver program with the program 'help' for lesson manual, outline, and storyboard of web based instruction on research proposal.

5. Create web based instruction on research proposal according to its content by describing with animated figure or character.

Evaluation of computer assisted instruction

The web based instruction on research proposal was evaluated by five experts with the following scales:

Excellent	=	5 points
Good	=	4 points
Fair	=	3 points
Poor	=	2 points
Fail	=	1 points

Data interpreting criterion based on Kannasute (1995, p.17)

4.50-5.00	=	the best
3.50-4.49	=	good
2.50-3.49	=	fair
1.50-2.49	=	less
1.00-1.49	=	the least

Web based instruction on research proposal must have mean more than 3.50 in every aspects with explanation 'good' and the overall evaluation must have mean more than 3.50 which imply good quality and can be used.

Data collecting

1. Explained web based instruction on research proposal to the undergraduate students who enrolled subject 'Research methodology', first semester on 2011

2. The undergraduate students who enrolled subject 'Research methodology', first semester on 2011 did the achievement before study for 30 minutes. The students have to pass 60 percent.

3. Conducted research by using web based instruction on research proposal with the undergraduate students who enrolled subject 'Research methodology', first semester on 2011. The content divided into seven units for seven weeks. Each week has three periods. One hour for one period with twenty-one in total. The students have to do exercises. The web based instruction has a role as a teacher. The students study in the self-access room , information Centre, Rajamangala University of Technology Lanna, Chiang Rai. Teacher has a role as the consultant.

4. The undergraduate students who enrolled subject 'Research methodology', first semester on 2011 did the achievement test after study for 30 minutes. The students have to pass 60 percent.

5. Marked the test by using Zero-One Method which one point for the correct answer and 0 for incorrect, blank answer, or choose the answer more than one item.

6. Students evaluated their satisfaction to web based instruction on research proposal.

Data analysis

1. Statistic for analysis web based instruction on research proposal is 80/80

First 80 is effective of process
Second 80 is effective of result

2. Figured out the reliability of achievement test by using formula KR-20 of Kuder Richardson (Boonrieng Kajornsilp, 2000. p.163)

3. Compared study achievement of the undergraduate students who enrolled subject 'Research methodology', first semester on 2011 before and after study by using t-test for dependent samples.

4. Result

1. The effective of web based instruction on research proposal is 80/80 which can be concluded that web based instruction on research proposal for the undergraduate students; Rajamangala University of Technology Lanna is 90.01/93.68 which is according to the hypothesis of 80/80

Table 1 the effective of web based instruction on research proposal

Content of web based instruction	E_1	E_2
Unit 1	89.90	93.90
Unit2	91.10	94.60
Unit3	89.90	92.90
Unit4	89.30	93.60
Unit5	90.20	94.30
Unit 6	89.70	92.90
Unit 7	90.00	93.60
Total of the average	**90.01**	**93.68**

2. The comparison for study achievement before and after study for the undergraduate students, Rajamangala University of Technology Lanna who study with web based instruction on research proposal. It was found that the students had higher achievement after study than before study with significant different 0.01 which was according to the hypothesis. This implied that their study had improved.

Table 2 the comparison for study achievement before and after study for the undergraduate

students who study with web based instruction on research proposal.

Content of web based instruction	**N**	**Total the scored of pretest**		**Total the scored of posttest**		**t**
		μ	**σ**	**μ**	**σ**	
Unit 1	**100**	**4.59**	**1.85**	**9.39**	**.49**	**.00****
Unit 2	**100**	**3.58**	**1.97**	**9.46**	**.52**	**.00****
Unit 3	**100**	**3.68**	**1.32**	**9.29**	**.57**	**.00****
Unit 4	**100**	**4.19**	**1.91**	**9.36**	**.50**	**.00****
Unit 5	**100**	**3.68**	**2.05**	**9.43**	**.51**	**.00****
Unit 6	**100**	**3.91**	**1.33**	**9.29**	**.59**	**.00****
Unit 7	**100**	**3.69**	**1.28**	**9.36**	**.59**	**.00****
Total of the average		**3.90**	**1.67**	**9.36**	**0.53**	

3. The satisfaction for 100 undergraduate students, Rajamangala University of Technology Lanna for web based instruction on research proposal found that the web based instruction on research proposal was highly satisfied as in hypothesis

Table 3 the satisfaction for 100 undergraduate students for web based instruction on research
proposal

Item	**Details**	**μ**	**σ**	**Level of satisfaction**
1	clear and consistent of objective and course content	4.06	.69	Much
2	correlate and comprehensive of objective and tests	4.10	.70	Much
3	accuracy of language explained	4.01	.77	Much
4	sequence of the presentation	4.01	.758	Much
5	clear pictures in the lesson	3.96	.75	Much
6	proper font used	3.95	.70	Much
7	document linkage	4.10	.68	Much
8	clear instruction and questions	3.96	.63	Much
9	result declare immediately	4.02	.65	Much
10	fine format display	4.03	.71	Much
11	easy to process	3.87	.69	Much
12	interesting presentation	3.99	.64	Much
13	knowledge obtained from using web based instruction	4.03	.65	Much
14	can be used for writing research paper	3.91	.60	Much
15	assist in research topic decision	4.05	.57	Much
Total of the average		**4.00**	**.13**	**Much**

5. Discussion

1. The effective of web based instruction on research proposal is 80/80 which can be concluded that web based instruction on research proposal for the undergraduate students; Rajamangala University of Technology Lanna is 90.01/93.68 which is according to the criterion. This is because the use of browser those learners can access information at anytime and anywhere. Teacher and students interacted through computer network. This was relevant to the research of Kittisak Wannatong (2002, p. 47-57) which is the learning model for subjects Information technology and computer on software for Matayom 4 students, Anukulnaree school, Muang District, Kalasilp. Research sample was 47 students. The achievement analysis was E1/E2=86.42/83.14 and the index is 0.67

2. Achievement of the undergraduate students, Rajamangala University of Technology Lanna who studies from web based instruction on research proposal was progress. This is because teaching by using computer can solve the problem of

teaching and learning as well as motivated by technology and new teaching styles. Students have skill and can study by themselves. This was relevant to the research of Rung-roj Kaew-u-rai (2000, p.53-60) which is the development of teaching and learning through web network. It was found that the comparative of the students who learned through web network and who did not with the significantly different is 0.01

3. The comparison for study achievement before and after study for the undergraduate students. It was found that the students had higher achievement after study than before study according to the criterion with was 60 percent. This is because web based instruction contains animated figure and character with no calculation. The students have to concentrate on the lesson which can create motivation that the students can know their score. This is relevant to the research of Akekarin Vijitpan (2003, p. 73-82) who studied e-learning for subject 'Information communication' for 40 diploma students majored computer, faculty of Electical Power. The result was the achievement after study was higher than before study with significantly different 0.01

4. The satisfaction for undergraduate students, Rajamangala University of Technology Lanna of web based instruction on research proposal was highly satisfied. This is because of motivation that the students used all sensations such as look, touch, and listen. The content concerning the matter that can be applied in everyday life. The students like to study. This is relevance to the research of Pornphom Chupwa (2004, p.87-90). She studied the development of web based instruction subject 'Operating system', parts of computer for diploma students, Yasotorn commercial technology, Muang district, Yasotorn. It was found that the satisfaction to web based instructor was highly satisfied.

6. Suggestion

1. Compare E-learning and computer assisting instruction such as internet or intranet in the other subject.

2. Compare achievement of web based instructor every units of each subject

3. Compare the students who are going to continue their study and who are going to work by using web based instructor

4. Conduct research regarding the development of web based instructor as stand-alone or internet or intranet.

5. Conduct collaboration research for web based instructor for teacher and students in all subjects.

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Technology and Struggling Readers: The Ticket to a Brave New Future

Ryan Spencer

University of Canberra, Australia

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Abstract

Technology is changing the way reading is taught and is adding new possibilities to existing pedagogical practices. The challenge for educators is to effectively incorporate new technologies in the reading classroom to effectively introduce students to the experience and benefits of multi modal texts. As Larson (2009) notes, multimodal text experiences are common for learners as they engage with a variety of text mediums on a daily basis. In order to best prepare students for rewarding reading experiences, they need to be equipped with the skills to utilise the full potential of these devices.

This research paper serves to challenge existing notions of reading instruction and explores the potential that new technologies provide towards assisting struggling readers. Kindles, iPads and other such technologies are discussed while reflecting upon the immense benefits they provide to reading engagement and the building of comprehension skills. Research by Barone & Wright (2008) supports the use of technologies to support engagement noting "Greater engagement equals higher achievement. End of story"(p. 302).

By providing an analysis of current research into best practice techniques and sharing best practice examples from the classroom, this paper provides a pedagogical base for further consideration. Case studies of the effective use of technology within the U-CAN READ Literacy Intervention Program (Australia) and a local primary school are compared in order to make recommendations for classroom integration.

Technology is an essential component of the modern literacy classroom and is proving to be a unique asset when assisting struggling readers in their development. The term new literacies is frequently applied to forms of technology and the associated processes which assist a student in developing their literacy related skills. New literacies is successfully defined by Leu, Kinzer, Corio & Cammack (2002), as the skills, strategies, and insights necessary to successfully exploit the rapidly changing information and communication technologies that continuously emerge in our world (p.1572). Leu, Kinzer, Corio & Cammack go on to note that the defining feature of new literacies is that they are ever changing, as is the technology that delivers them into the classroom.

New literacies and their use within the classroom have already demonstrated the potential to change traditional aspects of the literacy classroom. The use of a variety of technologies in reading education is constantly evolving due to a wide variety of factors, including; the rapid development in new technologies and the development of new features associated with devices. The importance of analysing research associated with this topic cannot be overstated as it provides the lens by which to investigate the educational impact that new literacies have upon traditional pedagogical approaches to teaching reading.

The importance of new literacies within future reading instruction is without question. The way in which students interact with texts is rapidly changing. As Larson (2009) notes, multimodal text experiences are common for learners as they engage with a variety of text mediums on a daily basis. Evans (2005) defines texts in a number of forms, including "a chunk of discourse – a speech, conversation, radio program, text message or photo in a newspaper" (p.8). The Adelaide Declaration outlining Australia's National Goals for Schooling in the 21st Century, outlines the importance of new literacies in the Australian education system by stating with importance that students leave school confident, creative and productive users of new technologies, while understanding the impact these technologies may have upon society.

What does the research say about technology and reading instruction?

Literacy and the way in which we interact with it has slowly changed and evolved over a long period of time. New literacies are speeding up this process dramatically, changing the nature of literacy practices and interactions both inside and outside of the classroom. The way in which a student engages with a text is changing, dependent upon their interaction. Leu (2011) outlines that literacy has become deictic with the development of the Internet, changing rapidly over a short period of time. The development of the Internet provided a unique opportunity for many to broadcast vast amounts of unique information to a wide audience in a relatively easy manner. The natural progression of Internet based technologies has resulted in the development of a broad range of different tools that can be used to interact with literacies in a variety of new ways. Leu et al. (2004) see the transformation from the Internet into the broader range of new technologies as an area of concern for schools as they work to successfully skill students in their effective use and meet concerns expressed by parents.

When integrating new technologies within a reading classroom, there is a risk of not creating enough change in practices to make the potential benefits of the technology worthwhile. Researchers suggest that many educators simply integrate the technology into the classroom with little consideration of the benefits that it may deliver. Honan (2012) refers to educators using new technologies within classrooms as 'old wine in new bottles' (p.83). This example highlights that some educators simply use electronic texts in the same form as they would a paper copy of a book. In working in this fashion, some educators are failing to realize the potential that these texts can provide. Bormann & Lowe (2010) and Larson (2010) refer to the benefits that reading on an electronic device can provide. Empowering readers by providing opportunities to adjust font sizes and use text to speech functions enables them to use in built features to support their reading development and therefore engage with the text in a more complex manner than with a traditional paper text.

Developing struggling readers' skills in the use of new literacies increases their ability to become more proficient readers. The experiences of technology below highlight the use of specific devices in a range of educational settings.

Using e-Readers to assist struggling readers

The use of e-readers in the U-CAN Read Literacy Intervention program in Australia has empowered disengaged readers to take control of their own learning, and serves as an example of how technology can be best utilised in a one on one setting. In their paper, Technology the Bridge to Reading Success, Lowe and Spencer (2012) detail how technology has been effectively used to motivate struggling readers. The case study details the way in which the Kindle e-reader was used to re-engage John with the reading process. The Kindle served two purposes. Firstly, it was the bridge to engagement because John already demonstrated an interest in electronic devices and secondly, it provided readily accessible reading material to meet his interests (Lowe & Spencer 2012).

The Kindle in this case study provided the opportunity for John to read on his own terms. The Kindle allowed John to modify the size and positioning of the font to his specifications without him feeling overwhelmed by a page of text-dense print. The screen reader and the dictionary prompt were available to support John when he confronted unfamiliar words. According to John, the Kindle was "cool". It did not trivialize reading nor make what he was reading appear immature to anyone who may observe his engagement (p.2477). The Kindle allowed John the flexibility to make choices about his reading content, complimented his use of technology and gave him the independence that adolescents strive to have.

In this case study, the kindle was initially used to display John's self-authored content, as this was the only reading material that was of his interest. The kindle served as a bridge to enable John to make the passage from reading material that was created by him, to formalised fiction that he had previously described as too long and too hard (p.2477). In summary the authors describe the value of the e-reader in engaging John in reading as providing authentic reading experiences, giving students responsibility and choice in what they read and encourage students to be self-regulating (p.2480).

Larson (2010) provides a comprehensive evaluation of the use of Kindles within a whole class setting, working with struggling readers. In her study, Larson notes that the e-reader promoted new literacy practices, whilst extending connections and promoting engagement (p. 17). Larson noted that the Kindle tools (adjusting font size, text to speech functions) were those that most prompted engagement and placed the reader in greater control when reading the text.

Ciampa's study exploring Canadian primary grade student's experiences with reading e-books provides another opportunity to assess the use of e-readers in a whole class setting (Ciampa, 2012). This study is useful as it also highlights the differences that may be identified to traditional reading methods. Ciampa's analysis of the reading behaviours of the students in the class prior to the introduction of technology were characterized by low participation levels and frequent unmotivated off task behaviours. Children in the class were frequently noted to stop reading when reaching unfamiliar words and were heavily reliant upon teacher assistance in order to continue (p.13). During the study, students were introduced to e-readers and read texts in a similar way to traditional texts. Observations of these sessions indicated that students were on task and engaged all of the time (p.14). Clear indicators of an increase in comprehension were also evident with the use of e-readers. Students were more inclined to have a go at answering questions about the text and were correct on more occasions (p.15). Whilst it is easy to identify that motivation was a clear benefit from the use of technology, the side benefits of greater engagement with the text and decreased off task behaviour illustrate clear advantages towards meaning making and therefore increased levels of comprehension. Ciampa concludes her study on a valid note by recommending that e-reading tools be used alongside existing models of reading (p.21) to ensure that the practice is integrated and adaptable.

Using iPads to assist struggling readers

McClanahan, Williams, Kennedy & Tate (2012) underline the multiple ways in which the iPad has been used to effectively support reading instruction for disengaged learners. Most notably, the ability to use the device for effective one on one instruction is demonstrated (p.20). In analysing research into the use of new technologies with struggling readers, the modifications that can be made to the text are considered to be of the most useful. The authors detail a one on one reading intervention using an iPad for a variety of reading experiences with Josh, an elementary student diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). The study investigated the use of the iPad in a number of ways, including reading e-books, using educational websites and utilising educational games. McClanahan et al. (2012) note that an activity of particular benefit was an e-book reading app that was based at Josh's instructional reading level. The app allowed Josh to read the text whilst recording his voice, and then re-read the text while listening to his own narration (p.24). The benefit that was gained from this activity was that by being able to listen and identify his own miscues, he was able to improve his level of comprehension and gain more from the story. The use of the iPad in this way demonstrates a clear gain to engaging and assisting reluctant readers. Not only does the iPad provide for increased levels of engagement, as mirrored in previous accounts with e-readers, it also provides the means for a way in which to assist with increasing awareness of the text and build comprehension.

Culen & Gasparini's (2011) Norwegian study analyses how iPads can effectively be used to assist with the teaching of reading in a classroom setting with 26 students. In the study, students were immersed in a technology rich classroom that along with use of the iPads, also included interactive whiteboards, laptops and stationary PC's (p.201). The iPads were able to be taken home by students, which ensured that students had ample opportunities to become familiar with the use of the device and opportunities to experiment with its use. The theme of engagement was once again evident as a result of this study. 85% of students in the beginning of the study reported that the iPad was their preferred platform for reading (p.206). This figure remained consistent up until the end of the study, where students still preferred this method than traditional print books.

The integration of iPads into a medium sized comprehensive primary school in the Australian Capital Territory served to develop new pedagogical practices in the teaching of reading amongst educators within the school. The leadership team within the school aimed to provide all classes with reasonable access to class sets of iPad devices for use in literacy learning contexts. Little professional in-service was provided to the predominately young teaching cohort, which provided the opportunity for experimentation and new discoveries. Interviews with teaching staff confirmed that the iPad had the advantage of driving participation in reading lessons, by encouraging students who would have been otherwise reluctant to engage in the lessons (Personal Communication, 10 December 2012). The use of the iPad was also credited to the success of struggling readers to create authentic reading experiences, including opportunities for them to self-correct their own reading while using effective strategies for prediction of the text.

So what do these examples tell us?

Simply put, the overwhelming benefits of the use of technology with struggling readers are motivation and in turn, engagement. These examples work to prove the claim made by Barone and Wright (2008) that 'greater engagement equals higher achievement. End of story' (p.302). Each experience indicates how the use of technology encouraged otherwise reluctant readers to re-engage in a new and exciting way. Motivation alone however is not the only indicator of success when using technology. The ability for technology to make texts accessible in new ways through the adjustment of font sizes and layouts are also valuable advantages. The benefit that these devices play in the development of reading comprehension through voice recordings is also important to be considered. Some disadvantages that were noted across each of the studies usually concerned non-pedagogical issues, such as access to technology, compatibility of technology and systems related issues.

In summary, the following key points can be made:

1. *Technology motivates and encourages* – Students that are otherwise disengaged when it comes to reading traditional print books are excited when the reading material is presented in an electronic form.

2. *Technology gives students responsibility and choice in what they read* – By allowing students the choice to read what they like on an electronic device and

making it accessible through font size or text to speech functions, educators are driving authentic reading experiences.

3. *Students are encouraged to be self-regulating* – Reading on an electronic device is an overwhelmingly private experience, no-one can see what the student is reading. Students make choice on what they want to read based on their own opinions – not the peer pressure exerted from others.

4. *Technology provides the means by which to develop skills in 'New Literacies'* – Reading in this technology assisted style provides students with the opportunity to develop skills in the use of new literacies, which are transferable across disciplines.

Research clearly identifies the need for, and suitability of using technology in new and different ways within the reading classroom to support and encourage struggling readers. Practical examples prove the value and the advantages that technology can provide. Assisting struggling readers in this way provides the set of skills required to be productive and self-equipped learners.

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The Development of the Instructional Package Together with Augmented Reality

Wiwat Meesuwan

Naresuan University, Thailand

0073

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1. Introduction

The learning of the students in 21st Century is that each student participates in the learning, both in reality world and in digital world. The student requires information in digital learning environment. The students like to work together and are independent; they apply entertainment and innovative, they have high expectation, they are good at expressing opinions, they are honest, they work together happily, and they are creative. This is the change of learning in Thai society to be of good quality and up-to-date.

The learning process management requires the management of contents and activities to be consistent with the students' interest and aptitude, considering on the differences among persons, the practice of skill, the thinking process, and managing process, the facing with the situation, and the application of knowledge for the prevention and for solving problems, managing activities for the students to learn from real experience, to practice real work, with the promotion of the learning climate and environment and learning media.

Although the education has come to the learning era of 21st Century, the current instructional package still play in important role; they are also developed in forms of contents and forms and the presentation method.

The development of current instructional package requires different forms and contents and presentation method in form of electronic media, electronic book, electronic publications. Therefore, the learning media is important to help educational institute to manage the learning and teaching to achieve the objectives of the curriculum. Media is the tool for learning, for disseminating knowledge and understanding, and for increasing skill and experience, for building learning situation, for stimulating thinking skill. Managing instruction to promote the development of the students must open chance for students to take part in the learning as much as possible.

Applying Virtual Classes in the instruction leads to the response to learning of the students, for sharing knowledge, expertise, and skill. The Virtual Learning Form is changed to many forms especially the one called Augmented Reality Technology. Feng Zhou defines it as the technology using computer to create virtual pictures, the pictures created would be overlapped with the physical objects in real time; this is different from virtual reality (VR) that is only to create pictures in digital form; the user can access to the more complete virtual environment and can respond to the virtual pictures created by real objects in real world.
According to the role of Augmented Reality Technology as mentioned, when used with the learning based on development of the Augmented Reality Technology, it can be used in the normal, face-to-face instruction. The students can use thinking process, language, non-verbal language, or other kinds of communication while learning in the Augmented Reality Technology.

2. Objectives

1. To study elements of the instructional package together with the Augmented Reality Technology

2. To develop instructional package by the Augmented Reality Technology under studied elements
3. To compare the students' achievement before learning and after learning by using the Augmented Reality Technology
4. To study into opinions of the students towards instructional package using the Augmented Reality Technology

3. Scope of the Research Project

Scope on data source used in the research can be divided into 2 groups as follows:

1. Form development stage:

- The experts on educational technology are the ones with educational degree in the educational technology of Ph.D. level, have teaching experience in the educational institute, and are involved in the education for not less than 3 years, for 3 persons; the experts would consider the forms of instructional package together with the Augmented Reality Technology created by the researcher.

- The experts on research, on curriculum and teaching, have educational degree in research and assessment for the education, or the instruction curriculum in Ph.D. level, have teaching experience in the educational institute, and are involved in the education for not less than 3 years, for 3 persons; the experts would consider the forms of instructional package together with the Augmented Reality Technology created by the researcher.

2. Experimental stage

The researcher specifies data sources for experiment including 10 fourth-grade students from Wang Itog School, who study in Semester 2 of 2012 by purposive sample.

The scope of contents and tools used in development consist of

1. Contents: it is about five major means in occupational group, of primary education. Inside the learning set, there has been a preparation for activities, media used and tests used for assessment. Contents consist of five major meals including carbo hydrate, protein, lipids, vitamin, minerals, and water.

2. Tools and programs used consist of:

2.1 Personal Computer
2.2 Webcam connected with computer on USB
2.3 Three-dimensional piece of work development application, Google SketchUp
2.4 Augmented Reality Tool

4. Tools used in the research

The research on the instructional package together with the Augmented Reality Technology has tools as follows:

1. Instructional package together with the Augmented Reality Technology
2. Assessment Form of instructional package together with the Augmented Reality Technology
3. The instructional package together with the Augmented Reality Technology
4. The Assessment Form of instructional package together with the Augmented Reality Technology

5. The questionnaire into the opinions of students towards the instructional package together with the Augmented Reality Technology

5. Methodology

The methodology is as follows:
5.1 The processes for developing the instructional package together with the Augmented Reality Technology are as follows:

- Study and have a field trip: the research studies and searches from documents, books, journals, researches, and various sources to be guideline for conducting research, to specify concept, framework, and method, to analyze contents, to be guideline in determining the framework for the development of the instructional package together with the Augmented Reality Technology

- Perform the analysis in order to obtain the form of the instructional package together with the Augmented Reality Technology. This stage of research is to bring data in the process of studying document to be analyzed in order to find appropriate patterns with 3 aspects of elements including contents, techniques, and presentation.

- Present the form of the instructional package together with the Augmented Reality Technology by questioning 3 experts on educational technology

- Create the archetype of the instructional package together with the Augmented Reality Technology for 3 experts on educational technology and on the primary management of instruction to assess the archetypes of the instructional package together with the Augmented Reality Technology

5.2 The stage for the experiment and comparison of achievement and opinions of students towards the instructional package together with the Augmented Reality Technology

- After obtaining the instructional package together with the Augmented Reality Technology that is appropriate under the recommendation of experts and from the experiment, then test the learning achievements and assess into the opinions towards the instructional package together with the Augmented Reality Technology

- Instruction stage consists of:

Preparation stage: Divide students into groups, the group to be studied would be divided under the willingness of students for 2 persons per group, for 5 groups, and suggest on the rules of the group, the duties and role of the members, inform of the objectives and activities

Teaching stage: Introduce the instruction lessons, do pretest, suggest on content, suggest on the instructional package together with the Augmented Reality Technology, and assign work to each group

Group activities performing stage: Students learn together in the group, each group has roles and duties as assigned from the study in the instructional package together with the Augmented Reality Technology, the research would observe

Examination of work and test stage: Examine the work of students, test for the performance as assigned, focusing on the examination of the work of each group and each person

Lesson conclusion and assessment of performance stage: The teacher and students help conclude on the lesson and do posttest

- After completing the instruction and measurement for the achievement, then do the questionnaire and express opinions and interview the students, under the frame

of questions in the questionnaire for the opinions of the students towards the instructional package together with the Augmented Reality Technology to reflect the feelings of students towards the instructional package together with the Augmented Reality Technology.

6. Conclusion on the result of the research

1. The form of the instructional package together with the Augmented Reality Technology is in appropriate criteria consisting of 1) teacher's manual, 2) student's manual, 3) lesson's content, 4) test, 5) media of the Augmented Reality Technology, 6) presenting three dimensional pictures, 7) form of marker, 8) other qualifications of the instructional package

2. It is found from the result of the development of the instructional package together with the Augmented Reality Technology under elements studied that the result of assessment from the expert is in the most appropriate level in all elements.

3. It is found from the study into the comparison of the learning achievement before learning and after learning of the samples using the instructional package together with the Augmented Reality Technology that the achievement after learning is higher than that before learning with statistical significance of .05 level.

4. Samples have opinions towards the instructional package together with the Augmented Reality Technology in that they like novelty and they are interested in the instruction while learning. They enjoy at learning, the contents presented are interesting, beneficial, and not too difficult, the students have a chance to take actions in performing activities by themselves, they are independent in choosing learning contents

7. Discussion

From the study into the instructional package together with the Augmented Reality Technology, research results can be discussed as follows:

1. In developing the instructional package together with the Augmented Reality Technology, the researcher has studied the design of instructional package and concept and the Augmented Reality Technology from documents and research concerned. And the researcher has studied the concept, theory of learning concerned to be the guideline in the development to be consistent with the process to make the students change their behavior, thinking, and ca learn by using the Augmented Reality Technology. It is found that the form of the Augmented Reality Technology consists of) teacher's manual, 2) student's manual, 3) lesson's content, 4) test, 5) media of the Augmented Reality Technology, 6) presenting three dimensional pictures, 7) form of marker, 8) other qualifications of the instructional package, are forms that can developed and used in the instruction; this is consistent with the concept of Kapfer & Kapfer stating that the instructional package is the form to communicate between the teacher and the students, consisting of suggestions for the students to perform learning activities, resulted from learning by instructional package. The form of the instructional package together with the Augmented Reality Technology that is developed can be used for instruction for group activities and self-study as well

because in each element, there are sub-elements showing the details and procedures for applying instructional package appropriately.

Besides, in the study into the elements in the Augmented Reality Technology, the researcher has brought the concept and the development of the Augmented Reality Technology, its application, tools concerned, to be guideline in ordering details in each element in the Augmented Reality Technology that must be developed to be instructional package, especially on the Augmented Reality Technology, three-dimensional pictures, Marker's pattern.

2. It is found from the result of the development of the instructional package together with the Augmented Reality Technology under the studied elements that the assessment result from the experts is at most appropriate level in all elements; this is because the development of the instructional package together with the Augmented Reality Technology is under the forms of various elements studied by the researcher because the Augmented Reality Technology can be applied with other technologies concerned in learning of the students, and can provide information to the students immediately, the students can have new experience by virtual dimension, and the students can learn together, the teacher build and boost the knowledge for the students through demonstration, conversation. The learning form would change to be more of the Augmented Reality so that the students can have experience and can link contents to the specific place or objects that are appropriate with the contents learnt from three-dimensional pictures, leading to the extension of learning to be outside the class room more, and promoting the learning from the old form. And in some cases, the Augmented Reality Technology can be combined with other forms of learning; this is consistent with Kaufmann, Hannes stating that in applying the Augmented Reality Technology in the instruction, the activities development should be designed first before actual learning, by determining the exact role of teacher that would reflect the varieties in constructing knowledge.

3. It is found from the result of the study into the comparison of the learning achievement before learning and after learning of the samples using the instructional package together with the Augmented Reality Technology that the achievement after learning is higher than that before learning with statistical significance of .05 level. This is because the development of the instructional package together with the Augmented Reality Technology is done under the form of each element developed by the researcher, being based on the principles of educational theories to be elements in the creation. The psychological principle is based in the instruction as well. Therefore, the creation of the instructional package together with the Augmented Reality Technology that is based on the theory would help the instructional package created to be more efficient for the instruction. This is consistent with Kapfer & Kapfer stating that the instructional package is the form to communicate between the teacher and the students, consisting of suggestions for the students to perform learning activities, resulted from learning by instructional package.

4. Samples have opinions towards the instructional package together with the Augmented Reality Technology in that they like novelty and they are interested in the instruction while learning. They enjoy at learning, the contents presented are interesting, beneficial, and not too difficult, the students have a chance to take actions in performing activities by themselves, they are independent in choosing learning

contents, the pictures presented are similar to the real one, the size of the picture makes it possible to see the pictures easily and is appropriate for the computer monitor because the instructional package together with the Augmented Reality Technology developed is designed and developed and applied in the process studied systematically, making the students to be independent in seeing what they learn and can see things around, this affects the emotion and learning at the same time. Human learn through five senses of perceptions including eyes, ears, nose, skin, tongue, and experience with the Augmented Reality, this is to respond to the senses of perception through eyes and ears via the monitor and computer equipment.

Besides, teachers perform duties in designing and developing learning activities and explaining procedures concerned with the learning. Teachers do it systematically and manage the learning to have area for doing activities and learning, and searching and studying on one's own and with their group, together with the explanation from teachers and focus the students to learn by themselves under the specified contents and processes. Also, the students are to do it repeatedly with the suggestions from teachers. The students can manage the learning by themselves with the prior explanation on procedures and can record the conversation, talk, and can use the thinking process systematically, can provide suggestions to students themselves. There is a record of conversation and talk, and the use of systematic thinking process that make students understand their own knowledge structure. The design of the instructional package together with the Augmented Reality Technology encourages the students to take part in and to interact with three-dimensional pictures that are similar to those in their daily lives; so, it is to open more chance for new experience. Therefore, when users participate in the Augmented Reality, they would be motivated and would have continuous participation in learning activities.

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The Practice and Effects of Using Weblogs to Motivate EFL Non-English Majors to Read and Write in English Online

Wan-lun Lee

Fu Jen Catholic University, Taiwan

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1. Introduction

The remarkable advances in computer and online technologies have revolutionized the way people read and write, and thus a lot of attention has been paid to how these new technologies have influenced or brought new challenges and possibilities to second or foreign language learning and teaching. Since paper-based materials are not the sole source of information anymore in the digital age, and more and more students are dependent on computer-based resources or even addicted to the Internet, language teachers have to cope with this change and help learners explore and benefit from the learning opportunities offered by Internet- mediated resources and innovations. As a Taiwanese English teacher teaching language courses for undergraduate students of non-English major for nearly ten years, I have been trying hard to deal with these students' reluctance to read or write in English out of class and worried about their Internet obsession or addiction that could easily hinder them from concentrating in class. Last year, an unusual silence during a ten-minute break caught my attention, and then I realized that it was because we were having the class in a computer lab and every student was busy using the Internet. After the break, I could not help but ask them how much time they usually spent on the Internet every day, and half of them admitted that they spent at least five hours a day online doing things such as facebooking, blogging, reading online news or magazine articles, checking and replying emails, watching videos, playing games, exchanging instant messages via MSN or chatting with friends on Skype. However, when I asked whether they did any of these in English, only few of them said if they were not too busy, they might read some celebrity or fashion news on English websites, but none of them had tried writing anything in English on the Internet. The results of this informal class survey made me wonder whether it would be possible to combine English reading and writing with computer-based resources and make these heavy Internet users feel like doing more online reading and writing in English.

After careful thought and consideration, I found that blogs (or weblogs), often defined or referred to as easy-to-create and easy-to-maintain online personal journals, might be used to create authentic and interesting web-based environments where the students could read and write in the target language at their own pace. To ensure greater success, a blog-assisted reading-to-write and writing-to-be-read project was designed for and incorporated into my 18-week *Advanced University English* curriculum. This paper reports on the approach and outcome of using this blog project with Taiwanese students of non-English major and explores the efficiency of using blogs in the EFL context to motivate these students to read and write in English on the

Internet by means of the empirical findings of a small-scale mixed methods study.

2. Blogs and Language Learning

Blogs have been gaining popularity since free blog hosting services such as *Blogger.com* appeared in 1999 (Pinkman, 2005), and such rapid growth in the number of bloggers and blog sites, as Kavaliauskiené, Anusiené, and Mažeikiené expound, results from the following features of blogs (2006, p.169):

> *Blogging does not require any knowledge of HTML. Blog entries are usually followed by a comment button, allowing readers to write a response….Blogs are easily linked and cross-linked to create larger on-line communities.…Weblog entries are made by typing directly into the browser and with the click of a button are instantly published on the Internet.*

It is clear that the quickness, easiness and interactive nature of blogging, together with the availability of free blog accounts on the Internet, have made blogs become more and more popular virtual communicative environments that have great potential for supporting and promoting language learning beyond the classroom.

Blogs have been seen or used as a pedagogical or learning tool and attracted considerable research interest in the field of language education (Pinkman, 2005). Campbell (2003) describes three types of blogs that can be used with ESL classes: the tutor blog that allows the tutor to provide course information, texts, exercises, or links to English websites; the learner blog that is run by each student not only as a personal online journal to write about whatever interests him or her and exchange ideas with other people using a comment button but also as an e-portfolio of their written work to show their language development over time; the class blog where the tutor and the learners can share and discuss messages, images and links related to the classroom discussion topics. Some or all of these blog types have been adopted or modified by the other blog-related studies, most of which research into the effects of applying blogs in writing classes (e.g. Johnson, 2004; Ward, 2004; Tseng, 2008; Zhang, 2009; Hashemi & Najafi, 2011), and a few of which investigate how blogging could encourage learner independence outside the classroom (e.g. Pinkman, 2005), raise learners' language awareness and development (e.g. Kavaliauskiené, Anusiené, & Mažeikiené, 2006), or promote EFL interaction, self-expression, and self-evaluation (e.g. Trajtemberg & Yiakoumetti, 2011). However, as Zhang points out, the use of blogs as an educational tool is still novel, so more empirical studies on the topic needs to be done in order to explore the potential of applying blogging in different aspects

of EFL learning and teaching more fully and thoroughly (Zhang, 2009).

3. The Blog-assisted Project

3.1 Rationale

The primary purpose of designing this blog-assisted reading-to-write, writing-to-be read project and using it with my students of non-English majors was to encourage them to do more out-of-class English reading and writing on the Internet. More specifically, this project aimed to motivate the target students to read online materials extensively on their own and then share their responses to what they read by writing and posting a reading report on their own blogs, which would be read and commented on by their group mates. It was believed that the tutor blog could serve as a virtual library offering students the freedom of choosing what to read among a number of literary and non-literary online texts with a wide variety of topics and subjects, and that the learner blog would provide them with a personal online space where they could express themselves freely in written English and exchange opinions with real-life audience through online asynchronous communication. More importantly, it was hoped that the implementation of this blog project in the university English curriculum would help the students improve their English reading and writing in a new, interesting and motivating way and make it more likely for them to become active and autonomous readers and writers of English.

3.2 Procedure

This project was implemented in my 18-week *Advanced University English* course taken by 40 first-year Taiwanese undergraduates of non-English major. According to the results of their university entrance English exam, these EFL students were categorized by the university as upper-intermediate or intermediate learners of English and were thus allowed to take this advanced-level English class. Prior to the implementation of the project, two hundred electronic, HTML-based English texts collected from free news, magazine, and literature websites were posted on the tutor blog on *Blogger.com*. In the first class gathering, a questionnaire survey was conducted to investigate the students' attitude toward and experience of reading and writing in English online as well as using blogs, and the results were used to modify the blog project. In the second week, the project was introduced to the students, and the tutor blog as well as a sample learner blog created by my teaching assistant was also shown to them. Then the students were asked to create their own learner blogs on

Blogger.com following my and the free blog provider's step-by-step instructions. When all was completed, their blog addresses were collected by my teaching assistant and emailed to every one in the class.

In the third week, the students were divided into eight groups of five and then instructed to follow the reading-to-write, writing-to-be-read schedule in the fourth week. That is, they had to choose one text on the tutor blog to read and post a reading report with the text title, genre, level of difficulty, reading time, a summary, response or feedback to it, as well as one or two discussion questions related to the text content on their own blog in even weeks; in odd weeks, they were required to visit their group mates' blogs and write their answers to the discussion question(s) at the end of the latest blog post. All this required no classroom time, and the students' blogs were used as their e-portfolios that could be easily accessed and checked by the teacher anytime. Since there were two exam and one holiday weeks in which the students were allowed to take a break from the reading and writing cycle, they read a total of six texts on the tutor blog and wrote six reports on their own blogs at the end of the semester. When the project was completed, the students were administered an exit questionnaire in class to give their feedback or responses to the project, and they were also asked to volunteer to come for a one-to-one interview with me.

4. Research Methods, Results and Discussion

To get an in-depth understanding of how my Taiwanese students of non-English major responded to the implementation of the blog project in the English class and determine the usefulness of blogging in motivating these students to do more online reading and writing in English on their own, a mixed-method approach using multiple data sources from questionnaires, interviews and students' blog reports was conducted in this practitioner research. The quantitative data were collected by means of pre-course and post-course questionnaire surveys as well as their blog reports while the qualitative data came from both the blog reports and my one-on-one student interviews. It should be noted here that the analysis and discussion would draw on and integrate both types of data, but greater priority would be given to the qualitative data, for the study needed qualitative depth to explore the students' views and perceptions regarding the practice and effects of the blog project.

4.1 Pre-course Questionnaire

During my first meeting with the class, a pre-course questionnaire survey was used to

help me know more about the students' prior knowledge, experiences, perspectives, and attitudes related to reading and writing on the Internet and blogging. The results of the survey revealed that few of them had the habit of reading or writing in English outside the English classroom or on the Internet; most of them had the experience of blogging (half of them had their own Chinese blogs) and liked the idea of integrating it with the English class. Moreover, a majority of them took a positive attitude toward reading authentic online texts in English, but some of them were worried that it might be a difficult and time-consuming learning task for them, which made me give up the original idea of asking them to read two texts on the tutor blog each week. On the other hand, when asked what sorts of reading topics interested them the most, these students preferred to read non-literary texts about sports, technology, science, fashion, entertainment and health as well as literary texts in the categories of adventure and fairy tales. These responses made me decide to replace some texts on the tutor blog with those related to the topics that would be more interesting to them.

4.2 Post-course Questionnaire

At the end of the semester, the students were administered a post-course questionnaire concerning their personal feedback or responses to this learning experience, especially their perceptions of the effects of this blog project on their motivation to read and write in English on the Internet. Overall, the students responded very positively to the use of this project in the English class, and the results of the questionnaire can be presented and discussed under the three categories: positive, negative and others.

Positive results included: 1) the majority of the respondents enjoyed reading the authentic English texts on the tutor blog; 2) most of them liked reading these English texts online more than reading them in the paper form; 3) although most of them preferred to read non-literary texts (news reports and magazine articles), all of them read at least one literary text (short stories and one or two novel chapters); 4) the majority felt that their attitude toward reading in English became more positive, that they had more confident of reading authentic English texts online on their own, and that they became more patient when dealing with longer English texts; 5) almost all of them agreed that this learning experience had helped them know more English websites, increase their interest in reading extensively in English online, read in English more frequently, improved their English reading skills and speed, and become more capable of expressing their responses to an English text in written English; 6) some of them admitted that knowing their group mates would read and comment on their blog posts gave them stronger motivation to write well and express themselves

clearly.

There were also some negative results, including: 1) most of the students admitted that they would give up reading a text that interested them if they found it too long or too difficult; 2) many of them felt that reading six texts and writing six blog posts in one semester was too much; 3) the majority admitted that they tried to complete the learning tasks of this project mainly because they wanted to get better final grades; 4) only a few of them believed that they would continue to read the texts on the tutor blog or write more on their own blogs after the project was completed. Other important findings include: 1) they chose a text to read mainly because they were interested in its topic and wanted to know more about it; 2) it was not difficult for them to find something interesting to read on the tutor blog; 3) the majority liked the way blogging was integrated into the project, the way the blog project was incorporated into this University English course and the way their blogs were used as their e-portfolios of their reading assignments.

4.3 Interviews

In addition to the questionnaire quantitative data, the interview qualitative data were collected and used to "add meaning to numbers" (Dörnyei, 2007, p. 45). A list of guiding questions were prepared to make sure what came out of the interviewees could help probe the research focus of the study, but extensive follow-up questions that were not on the list were still asked in response to the interviewees' answers. 20 out of 40 students volunteered to be interviewed and tell me what they thought about this blog project in person. Each one-on-one semi-structured interview was held at my office and took about 30 to 40 minutes. The interviewees were allowed to speak in Chinese, so none of them chose to use to answer my questions in English. All the interviews were recorded using an MP3 player so that I could "attend to the direction rather than the detail" during the interview, and "listen intently" to the answers afterwards (Bassey, 1999, p. 81). After each interview, however, I needed to get it transcribed from the digital sound recording, and then had the Chinese transcripts translated into English for research purposes.

Most of the findings from the interview data were in accordance with those from the questionnaires or offered supportive details to help explain some of the questionnaire results. For example, the questionnaire data showed that many of them did not like non-literary texts more than literary ones, but during the interviews, they explained that they preferred to read more news reports or magazine articles because those were

much shorter than short stories or a chapter of a novel. Another example was that a few of them complained that the writing part of the project was too time-consuming, and that was why they felt that doing six reading-to-write, writing-to-be-read cycles in one semester was too much for them as non-English majors. However, several interviewees said that they usually read more than one text on the tutor blog (one of them always read six or seven) and then chose the one that they found easier or easiest to make comments on to write their blog posts.

It is also worth noting that all the interviewees agreed that they valued and appreciated the opportunities of doing online reading and writing in English outside the classroom created by the blog project, and they all believed that this learning experience had helped them improve their English ability in one way or another, but many of them made it clear that they would not continue to do this after the class ended because they still regarded it as a kind of reading/writing assignment or because they did not think anyone would read and comment on what they wrote on their blogs.

4.4 Blog Reports

The students were required to complete and submit a blog report giving information such as why they chose the reading text, which genre it belonged to, which topic it was about, how much time they used to read it, how difficult they found it was, and how much they enjoyed reading it. These blog reports provided both quantitative and qualitative date. The results of the quantitative data showed that the most popular genre was the news report, the most commonly read topic was health, the most frequently labeled level of difficulty (from 1 to 5) was 3, and most of the reading was done within 30 minutes. The findings from the qualitative data revealed that the most frequently-used reasons for text choice were that the topic was interesting and the text was short, which agrees with the results of the questionnaire and interview data.

5. Conclusion

The poor English ability of university graduates or graduate students has been the major concern of many university educators in Taiwan. Living in the EFL environment and majoring in other subjects, these non-English majors do not have much chance or motivation to learn and use the target language in their daily lives, except in the once-a-week English class in the freshman year. Thus, although they were forced to memorize a lot of English vocabulary and grammatical concepts in secondary schools, it is very likely that they might forget everything more quickly than they can imagine if they do not keep using and learning the target language outside the English classroom. This blog project was designed for these Taiwanese students of non-English major, aiming to use the charm and unique functions of blogging technology to motivate them to do more English reading and writing on their own. As Arnold (2009) points out, the Internet is a free and valuable source of material for foreign language learning, and should also be used for communication and independent learning in today's world.

The major findings from both qualitative and quantitative data of the current study show that the students' responses to the project were generally positive and that the blog project was especially effective in motivating these students to read extensively in English on the Internet and to write well on their blogs for their readers/group mates. There was also evidence that the implementation of this project had increased their ability and confidence in tackling authentic English texts on their own and in expressing themselves in written English. Although this project was carried out for only 12 weeks of one semester, and not many of them agreed that they had formed the habit of doing online English reading and writing out of class or felt like continuing to use the blogs to read and write in English after the project was completed, it is believed that even these negative findings can still provide significant pedagogical implications for future use of weblogs in ELT. This study intends to encourage more language teachers to incorporate blogs into their own teaching and inspire more researchers to further explore and determine the usefulness of blogging in language education.

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Using SMS for Conducting Quizzes with Instant Checking of Answers

Wali Omer

Hawler Medical University, Iraq

0101

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Background: Frequent quizzing is one of the major factors motivating students to study. The clicker system[1] was a promising technology but has some limitations. Most of the universities in the developing countries do not have it and some instructors have problem using it.

In this study, a system based on SMS is suggested. Mobiles phones are ubiquitous especially in the developing countries and almost all have Short Message Service.

Methods: An android application was developed by the author that receives SMS, grades them instantly and produces lists of names and scores, summary of scores and answers according to questions (more details in the appendix).

The system was tested in classrooms at Hawler Medical University[2]. Feedback from 250 students in stages 3 and 4 in addition to 10 instructors were analyzed both quantitative and qualitatively respectively.

Results: Most of the students (87%) thought that the new system was easy to use and more convenient compared to the traditional pen and paper. The only concern was money spent on the quiz (about 0.02 US$).

On the other hand, the faculties' feedback was overwhelming positive (100%) stating that it reduces the boring time of checking student answers from 30-60 minute depending on the class size to virtually zero.

Conclusions: The new SMS Quiz systems seems to be promising that reduces the chore of answer checking to zero minutes and the and students also finds is superior to the traditional pen and paper quizzes.

[1] http://www.amazon.com/clicker-student-remote-Gen1-Frequency/dp/0716779390
[2] Hawler Medical University, Erbil, Kurdistan region, Iraq.

SMS Quiz

Advantages of the new SMS Quiz System:

- Does not use special hardware: any mobile phone, even the most basic can be used.
- The student does not need to install any software, just send a simple SMS.
- Can grade the quiz instantly, the results can be shown as the SMS are received.
- Almost everyone has mobile phone especially in the developing countries.
- Produces student list in .csv file that can be ready directly by all spreadsheet software e.g. MS Excel.
- Can produce histogram of scores.
- Can produce a chart showing which question the student did answer best and which one worst.
- The data can be sent via Bluetooth or attached to an email.
- Reduces the boring time of answer checking to zero minutes.
- Most of the universities in the developing countries do not have Clicker Hardware system and are not willing to buy it.

Disadvantages of the new SMS Quiz System:

- Cost of the SMS may be a concern by some student especially if frequently done. Although the cost is very small (about 0.02 US$ in Iraq) but still this problem can be solved by making that number toll-free.

Note: if necessary, I can send the source code of the application.

Screens of the Application:

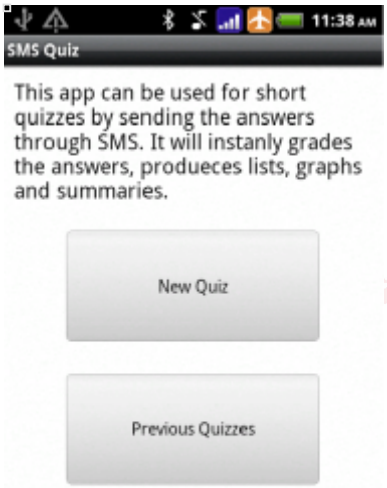

Figure 1: Main screen.

Figure 2: New Quiz Screen.

Figure 3: A quiz of 5 MCQs is entered.

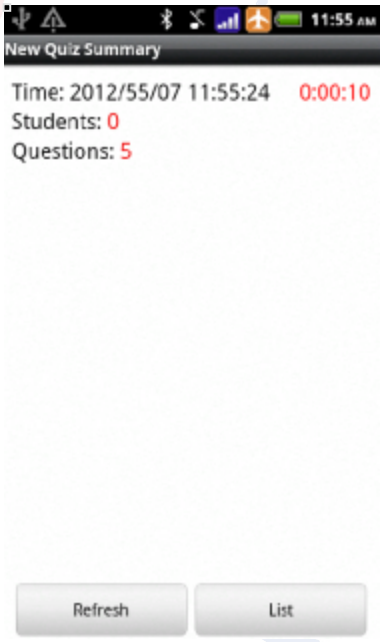

Figure 4: Listening to incoming SMS.

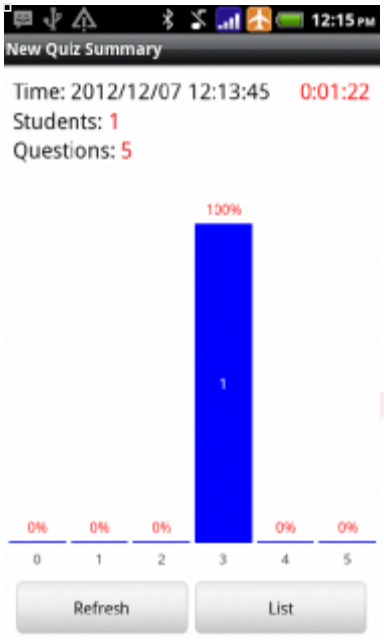

Figure 5: Results show as soon as the SMS received.

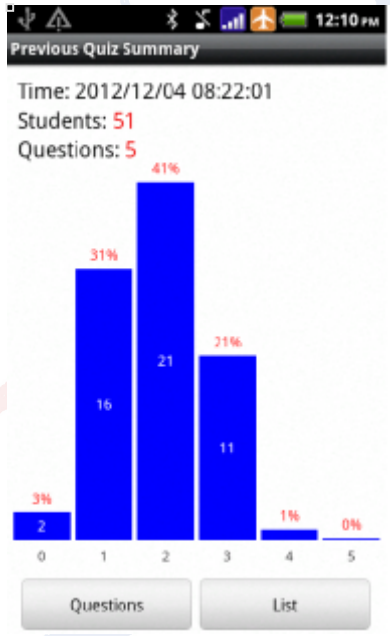

Figure 6: Until quiz time is over or all SMS are received.

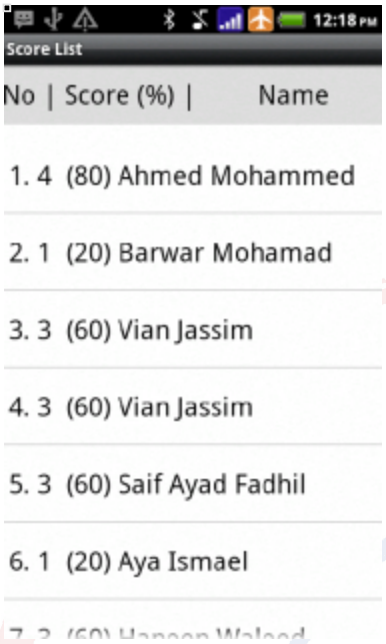

Figure 7: Score list.

Figure 8: Click menu to Export.

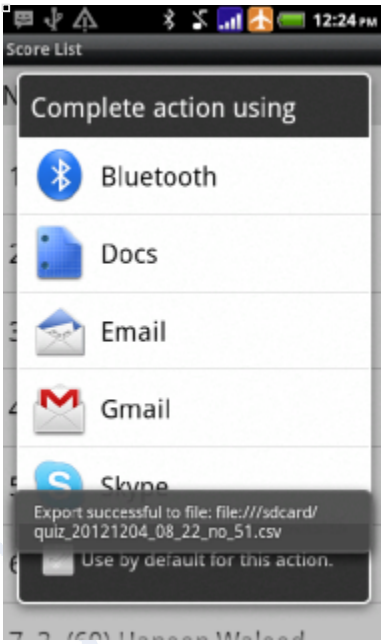

Figure 9: CSV file is saved to SD Card and you can send via Bluetooth or email…

The Synthesis of an Online Project-based Learning Model with a Knowledge Management System by Analyzing Student's Multiple Intelligence

Sumalee Siksen, Monchai Tiantong

King Mongkut's University of Technology North Bangkok, Thailand

0110

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Abstract

The objective of this research were as follows : 1) to synthesize an Online Project-based Learning Model with a knowledge management system by analyzing student's multiple intelligence, and 2) to evaluate the synthesized model. The research methodology consisted of 2 steps as follows : 1) synthesis of an Online Project-based Learning Model with a knowledge management system using focus group discussion from 10 experts, and 2) empirical evaluation of the synthesized model by 5 experts using purposive sampling. The data was analyzed by mean and standard deviation.
The research results revealed as follows : 1. an Online Project-based Learning Model with a knowledge management system by analyzing student's multiple intelligence from focus group discussion that consisted of 6 modules as : 1) Multiple Intelligence Testing Module, 2) Multiple Intelligence Classification Module, 3) PjBL & KM Module, 4) Online Learning Module, 5) Teacher and Examiner Module, and 6) Rubric Evaluation Module, and 2. the results of the synthesized model on empirical evaluation by experts showed that they accepted the model at a very good level ($\overline{X}$ = 4.64, SD. = 0.48). In conclusion, this can be used with synthesized models successfully.
Keyword: *Learning Model Synthesize, Project-based Learning, Multiple Intelligence*

1. Introduction

It is necessary for teaching systems to help students gain new skills in both learning and using new technology. Therefore, those involved in education are required to study and find out the best ways to stimulate students to have creativity and enjoy studying (Office of the National Education Commission, 2000). However, it is found that the current teaching systems emphasize knowledge or ability in terms of improvements, focusing on learning by heart, rather than thinking skills, e.g. analytical thinking, synthetic thinking and critical thinking. The above thinking skills will be helpful for the students when they begin to work. So, students should mainly be taken into account when considering any teaching system. The students should be encouraged to use various tools so that they would be more interested in learning. Besides, the need, the interest and the differences of any individual should be well satisfied. Thereby, the teachers are acting as advisors who suggest to the students how to use the tools as efficiently as possible (Kidanun, 2000).
Teaching via the internet helps support "Community of Learner" (Anderson, 2007), allowing the students to study and receive knowledge by themselves and by means of Learner Interaction (Kahler, 2000). The characteristics of the said teaching method, therefore, are appropriate to Project-based Learning because 1) the Project-based Learning is originated from philosophy of education emphasizing Learner Center, 2) the Project-based Learning supports cooperative learning through communication, exchange of information, knowledge and opinions among learners, and 3) the Project-based Learning enables the students to create concrete products, showing that the students have successfully gained knowledge (Hargis, 2005).

The instructors used the projects as guidelines to enhance the performance of learners according to Multiple Intelligence of Howard Gardner (Sakchai, 2009), who proposed nine items of intelligence as follow: 1) Kinesthetic Intelligence 2) Existential Intelligence 3) Interpersonal Intelligence 4) Intrapersonal 5) Linguistic Intelligence 6) Logical and Mathematic Intelligence 7) Musical Intelligence 8) Naturalistic Intelligence and 9) Spatial Intelligence. Once understanding the strength and weakness of their learners, the instructors can help them meet with successes. This is because his project based activity requires systematic and step-by-step operation in which the learners has to practically study and figure out what they want to know by their own.

From the above educational innovation, the author has an idea to incorporate Multiple Intelligence into the system. What is added herein will act as Learner Guidance System, allowing the learners to do projects based on analysis of Multiple Intelligence. The system is expected to replace the class instructors by synthesizing a new learning model. Then, the said synthesized model will be applied by developing an Online Project-based Learning and recommendation for learners based on analysis of Multiple Intelligence. This will support differences among individuals and provide them with utmost benefits.

2. Objectives of the research

2.1 To synthesize an Online Project-based Learning Model with a knowledge management system, then analyze student's multiple intelligence by using focus group discussions from experts.

2.2 To evaluate the synthesized Online Project-based Learning Model with a knowledge management system.

3. Scope of research

3.1 Population includes experts in terms of Teaching Design, Project-based Learning, Multiple Intelligence, and Information Technology.

3.2 The subjects include 10 experts in terms of Teaching Design, Project-based Learning, Multiple Intelligence, and Information Technology, who were chosen by means of purposive sampling. The said subjects were qualified as follow: 1) working as instructors in the fields of computer, Education Technology, Education Psychology, or related fields, 2) graduated from Doctorate degree, and 3) having over 5 years of experiences. The subjects were divided into 2 groups as below.

3.2.1 Ten subjects for synthesizing learning model by means of focus group discussion.

3.2.2 Five subjects for evaluation of the said synthesized learning model.

3.3 Research variables

3.3.1 Independent variable is the Online Project-based Learning Model with a knowledge management system by analyzing student's multiple intelligence.

3.3.2 Dependent variable is the evaluation of the above model.

4. Methodology

This research consists of 2 stages.

Stage 1 is the synthesis of an Online Project-based Learning Model with a knowledge management system to analyze student's multiple intelligence by using focus group discussions from experts.

1. Studying the articles, documents and researches about educational innovation, Project-based Learning, cooperative learning, social network, tools and software used to develop relevant systems and theories.
2. Drafting the primary learning model based on the data derived from the study of relevant articles, documents and researches in item 1; whereby the author set up 4 issues: 1) Project-based Learning, 2) Analysis of student's Multiple Intelligence, 3) Objectives and functions of learning model, and 4) Measurement and evaluation, expecting mainly to satisfy the personal differences among the students.
3. Presenting the learning model to the advisors for consideration and revision.
4. Synthesizing the Online Project-based Learning Model with a knowledge management system to analyze student's multiple intelligence by using focus group discussions from 10 experts.
5. Creating tools to evaluate the suitability of the above synthesized learning model.

Stage 2 is evaluation of the synthesized Online Project-based Learning Model with a knowledge management system to analyze student's multiple intelligence.

1. Having the stated synthesized learning model evaluated referring to suitability by 5 experts.
2. Improving the stated model according to the experts' suggestions.
3. Presenting the model in the form of a diagram and report.

4. Analyzing results of the learning model evaluation by mean ($\overline{X}$) and standard deviation (S.D.) consisting of 5 criteria for evaluation according to the idea of Likert.

5. Summary of research

The presentation of this research was divided into 2 stages as below.

Stage 1 The synthesis of the Online Project-based Learning Model with a knowledge management system to analyze student's multiple intelligence by using focus group discussions, including 6 modules as in figure 1.

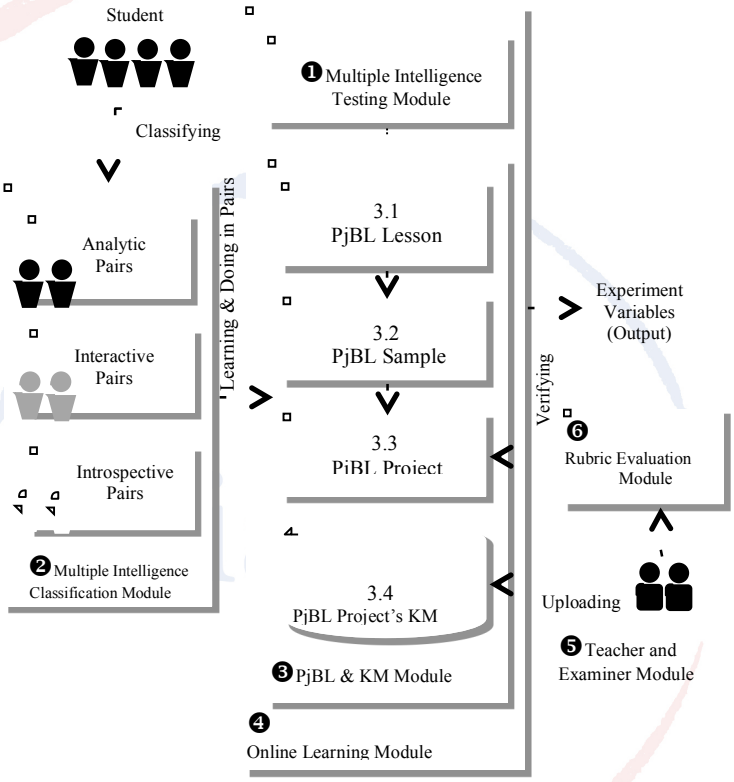

Figure 1 Online Project-based Learning Model with a knowledge management system.
(OPjMI Learning Model)

1. The Multiple Intelligence Testing Module is for classifying the learners into 3 multiple intelligence groups; that is, Analytic, Interactive and Introspective. Upon the enrollment of learners, the system will have them input basic information and take a multiple intelligence test of Howard Gardner (90 items).

2. Multiple Intelligence Classification Module is for categorizing the learners, by means of Think-Pair-Share, in mixed groups based on the results that the instructors derived from the multiple intelligence analysis of 3 student groups.

3. PjBL & KM Module is a guideline to carry out different projects as to the results of multiple intelligence analysis of the students; and to accumulate the works evaluated by the instructors and the experts in order to create knowledge; the said module is composed of the following 4 elements.

1) PjBL Lesson - guiding steps of the projects such as step-by-step suggestions, media, materials, publication, evaluation or other recommendation via website.

2) PjBL Sample - showing samples of each project that the instructors prepared in accordance with multiple intelligence of the students; i.e., Analytic (projects on exploration), Interactive (projects on experiment), and Introspective (projects on research), all of which are in the form of web database.

3) PjBL Project - accumulating the projects of learners, according to their categories, in the form of web database, waiting for evaluation by the instructors or the experts.

4) PjBL Project's KM - collecting and presenting the learners' projects already evaluated by the instructors or the experts, which then are uploaded onto the system to create a project database, in which the amount of data will increase and be a deep source of knowledge via the internet about projects in the future.

4. Online Learning Module is for combining the functions of module 1 and module 3 to be online or website based learning. The online tools for communication between learners and learners or between instructors and learners include webboard, e-mail, facebook and search engine, all of which are appropriate according to the researches and experts.

5. Teacher and Examiner Module is for the instructors to evaluate the learners' projects, and then upload them onto the online system in order to create database of projects, classified as to students' multiple intelligence. The said database is also a channel for the instructors to keep track of students' learning activity and to inform the students about the results of evaluation as well as further suggestions.

6. Rubric Evaluation Module is for creating a system of evaluating the projects of the students who have been learning online by means of rubric. In this research, the author applied analytic rubric assessment to define scoring criteria of 3 rating scales, dividing evaluation into 3 parts: work plan, work process, results and presentation.

Stage 2 Evaluation results of the synthesized Online Project-based Learning Model with a knowledge management system to analyze student's multiple intelligence.

The said model was evaluated by 5 experts in terms of module elements, objectives, functions, and proper application; and the results are as below.

Table 1 Results of the model evaluation in terms of module elements

Evaluation	Results		Level
	$\bar{X}$	S.D.	
1. Multiple Intelligence Testing Module	4.60	0.55	Very good
2. Multiple Intelligence Classification Module	4.60	0.55	Very good
3. PjBL & KM Module	4.60	0.55	Very good
4. Online Learning Module	4.60	0.55	Very good
5. Teacher and Examiner	5.00	0.00	Very good
6. Rubric Evaluation	4.40	0.55	Good
7. Overview of the model	4.40	0.55	Good
In terms of module elements	**4.60**	**0.50**	**Very good**

Referring to Table 1, it is found that the experts accepted the suitability of the model in terms of module elements at a very good level ($\overline{X}$ = 4.60, S.D. = 0.50)

Table 2 Results of model evaluation in terms of objectives and functions

Evaluation	Results		Level
	$\overline{X}$	S.D.	
1. Multiple Intelligence Testing Module	4.80	0.45	Very good
2. Multiple Intelligence Classification Module	4.80	0.45	Very good
3. PjBL & KM Module	4.60	0.55	Very good
4. PjBL Lesson	4.60	0.55	Very good
5. PjBL Sample	4.60	0.50	Very good
6. PjBL Project	4.60	0.55	Very good
7. PjBL Project'KM	4.60	0.55	Very good
8. Online Learning Module	4.60	0.55	Very good
9. Teacher and Examiner Module	4.80	0.45	Very good
10. Rubric Evaluation Module	4.80	0.45	Very good
11. In terms of coordination among modules	4.60	0.55	Very good
In terms of objectives and functions	**4.67**	**0.47**	**Very good**
In terms of application	**4.64**	**0.48**	**Very good**

Referring to Table 2, it is found that the experts accepted the suitability of the model in terms of objectives and functions at a very good level ($\overline{X}$ = 4.67, S.D. = 0.47), and in terms of application also at a very good level ($\overline{X}$ = 4.64, S.D. = 0.48)

6. Summary

The objective of this research were as follows : 1. to synthesize an Online Project-based Learning Model with a knowledge management system by analyzing student's multiple intelligence using focus group discussions from experts , and 2. to evaluate the Online Project-based Learning Model with a knowledge management system by analyzing student's multiple intelligence synthesized by the experts. Synthesis of the model using focus group discussions from 10 experts resulted in OPjMI Learning Model, which includes 6 modules: 1) Multiple Intelligence Testing Module, 2) Multiple Intelligence Classification Module, 3) PjBL & KM Module, 4) Online Learning Module, 5) Teacher and Examiner Module, and 6) Rubric Evaluation Module. Then, the synthesized model was evaluated by 5 experts, and it was found that the experts accepted the model at a very good level ($\overline{X}$ = 4.64, S.D. = 0.48). In conclusion, the synthesized model can be used successfully.

7. Suggestions

7.1 Suggestions for this research

The educational institutes that will apply this learning model should prepare instructors for the Project-based Learning as to the student's multiple intelligence in order to support differences among individuals.

7.2 Suggestions for next research

The learning model synthesized from this research will be developed as an Online Project-based Learning system with a knowledge management system by analyzing student's multiple intelligence so that it would be most helpful to the students.

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A Design System for Electronic Tale Book with Creative Activities to Enhance Creative Thinking of Elementary School Students

Kunthida Kunkhong, Noawanit Songkram

Chulalongkorn University, Thailand

0154

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Abstract

This paper is a report on the findings were: 1) to study the inputs (elements) and processes (steps) of a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students 2) to construct a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students 3) to study the results of using a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students and 4) to propose a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students. Instruments in this research consisted of a creative test, a specialist interview form, an attitude questionnaire and a design system for electronic tale book with creative activities to enhance creative thinking. The data were analyzed by average, standard deviation, and t-test. The samples for this study were 10 undergraduate students of Faculty of Education, Chulalongkorn university studied in computer based educational printed material production course and 12 experts in design and development, electronic book, children's literature and creative thinking.
The results of this study revealed that seven inputs are: 1) motivation 2) objectives 3) contents 4) learner 5) instructor 6) productivity and 7) evaluation and six processes are: 1) preparation 2) analysis 3) design 4) development 5) implementation and 6) evaluation. The productivity is an electronic tale book with creative activities. The implementation of a design system showed that students had posttest creative ability scores statistically significant at .05 level higher than pretest scores.

Introduction

Creativity is a very important skill in modern times because it is essential in the development of the country to be able to the invention of a new technology. Therefore, it is necessary to teach children having creativity by using creativity process. The stories promote the creativity of children for supporting the imagination. Now electronic tale books are the media to meet the needs of human beings to bring media into the books contained in digital form. Thus, undergraduate student in education should have skill to design electronic tale book with creative activities to enhance creative thinking of elementary students. In this research it has been design system an electronic tale book which consists of factors and process including creative activities such as 1.Dress up games 2.The incredible line games and 3.Coloring game. These creative activities blend in electronic tale book to develop creative imagination for the elementary students and improve achievement in learning.

The objectives of this study

The purposes of this research were as follows:

1. to study the inputs (elements) and processes (steps) about a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students
2. to construct a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students
3. to study the result of using a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students
4. to propose a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students

Hypothesis

The electronic tale book with creative activities posttest by using with the experimental group students was higher than the pretest at the .05 level of significant.

Research questions

1. What inputs, processes outputs and feedback of a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students?
2. Can undergraduate students design an electronic tale book with creative activities to enhance creative thinking of elementary school students by using the design system?
3. Can electronic tale book with creative activities improve elementary student's creative thinking skill?

Methodology

A design system for electronic tale book with creative activities to enhance creative thinking of elementary school students was R&D research. The methodology consisted of the following; the researcher

(1) Studied the inputs (elements) and processes (steps) about a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students.

(2) Constructed a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students.

(3) Studied the result of using a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students.

(4) Proposed a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students.

Instruments

Instruments of this research consisted of a creative test, specialist interview form, attitude questionnaire, design system for electronic tale book with creative activities to enhance creative thinking. The content validity of these instruments was obtained from twelve experts. These instruments were revised according to suggestion of the experts.

Experimental Stages

1. Study documents related research and systems to certified experts before trials.

2. Conduct activities for teaching the design of electronic tale book with creative activities for a period of 9 weeks (36 hours) as follows.

2.1 Undergraduate student design of electronic tale book with creative activities.

2.2 Students design electronic tale book in each steps

Processes	Contents	Active learning activities
1.Preparation	Consult the documentation by electronic guide system design tale book.	1. Instructor motivates student's interest. 2. Instructor gives orientation to the students. 3. Students work in pairs on a voluntary basis. 4. Students study the guide system design.
2. Analysis		1. Students analyze the audience to develop by the following analysis. 1.1 Research objectives and scope of the content of the third grade. 1.2 Analysis of the students about prior knowledge of the students. How to learn such as reading and listening skills of the students and interests of learners. 1.3 Analysis of events and activities, including analysis of the subject identification of structure, component of content, structure of a fairy tale,the elements of electronic book by using graphics, motion picture ,creative activities such as drawing a picture and using image and set the criteria for evaluating a rubric score. 1.4 Analysis of the context and conditions such as computer resources, media and devices.

Processes	Contents	Active learning activities
3. Design		1. Designed objectives, lesson content, and the content creation activities. 2. Students collected such as multimedia. 3. Students wrote scripts and storyboards. 4. Student's works submitted to the advisors and experts by suggestions for improvement.
4. Development		1. Students produced and spent time in development their works. 2. Students created electronic book as storyboards by computer programs. 3. Student's works presented to advisors and experts to improve and modify the defect. 4. Student's electronic tale book experimented with a small group and then be revised them.
5.Implementation		The electronic tale book with creative activities tried out with elementary students.
6.Evaluation		1. Elementary students took creativity test before learning with electronic tale book that designed by undergraduate students and then they took creativity test again. 2. Revised the design of electronic tale book with creative activities and presentation.

3. Undergraduate student took electronic tale book tried out for elementary students 21 hours. (7 weeks)

4. Undergraduate student have electronic tale book with creative activities to enhance creative thinking of elementary students and assessment by the quality assessment form of electronic tale book with creative activities.

Data Analysis

Undergraduate student have produced electronic tale book with creative activities that were measured by the quality assessment form which was classified by measuring criteria (as shown in Table 1). The creative thinking ability was analyzed by using dependent t-test in Table 2

Table 1: The results of the quality assessment form of electronic tale book with creative activities which divided as follow.

The quality assessment criteria of electronic tale book with creative activities.	**N** (book)	**Mean**	**SD**
1. The correctness of the content / material.	5	4.60	.55
2. Consistency of content with the purpose of learning.	5	4.60	.55
3. Consistent with the purpose of learning creative activities.	5	4.40	.55
4. Consistent with the contents of the image.	5	4.80	.45
5. Suitability of the content to the learner.	5	4.40	.55
6. Appropriate number on the level of the students.	5	4.20	.45
7. Appropriate creative activities with the content.	5	4.80	.45
8. Appropriateness of the composition.	5	4.80	.45
9. Appropriate size and format of the characters used.	5	4.20	.45
10. Appropriate font color and background.	5	4.40	.55

5 = Excellence 4=Good 3=Satisfied 2=pass 1=fail

The results showed that five electronic tale with assessment criteria were excellence and good.

Table 2: The results of means, standard deviation and a t-test dependent between the pretest and posttest creative thinking ability scores of the experimental group.

T-Test

[DataSet1]

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest	127.7931	29	23.74625	4.40957
	posttest	256.6897	29	22.09251	4.10248
Pair 2	F*	22.9655	29	5.40161	1.00305
	F*	38.8966	29	1.97022	.36586
Pair 3	F**	18.1379	29	4.81608	.89432
	F**	28.0690	29	3.72186	.69113
Pair 4	O	34.9655	29	8.87002	1.64712
	O	80.1379	29	13.49001	2.50503
Pair 5	E	51.7241	29	12.67702	2.35406
	E	109.5862	29	19.25490	3.57555

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	pretest & posttest	29	-.338	.073
Pair 2	F* & F*	29	-.071	.715
Pair 3	F** & F**	29	-.060	.756
Pair 4	O & O	29	-.139	.472
Pair 5	E & E	29	-.373	.046

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pretest - posttest	-128.89655	37.50176	6.96390	-143.16146	-114.63165	-18.509	28	.000
Pair 2	F* - F*	-15.93103	5.87933	1.09176	-18.16741	-13.69466	-14.592	28	.000
Pair 3	F** - F**	-9.93103	6.26174	1.16278	-12.31287	-7.54920	-8.541	28	.000
Pair 4	O - O	-45.17241	17.14449	3.18365	-51.69383	-38.65100	-14.189	28	.000
Pair 5	E - E	-57.86207	26.71239	4.96037	-68.02292	-47.70122	-11.665	28	.000

After using the process of a design system for electronic tale book with creative activities model, creative thinking ability was analyzed by the t- test dependent found that there was a significant difference between pretest and posttest of the experimental group in creative thinking ability at the.05 (See Table 2)

Findings

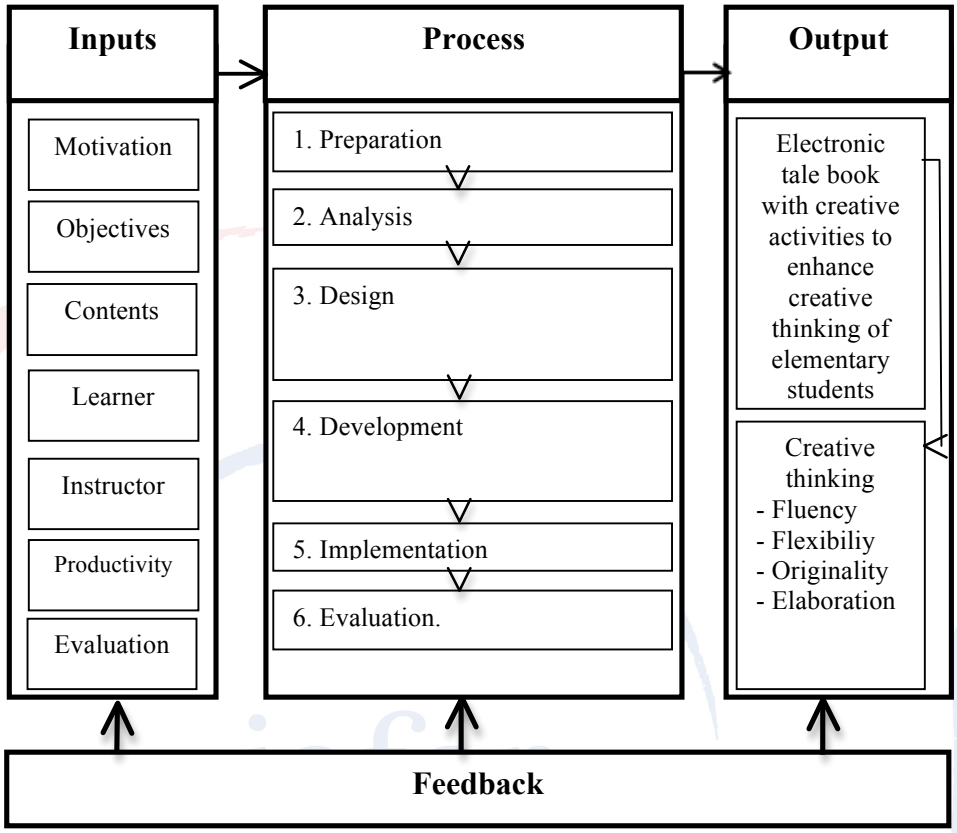
The results of this study revealed that:

1. The experts' opinions agreed that a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students consisted of seven inputs: 1) Motivation 2) Objectives 3) Contents 4) Learner 5) Instructor 6) Productivity and 7) Evaluation. The six processes consisted of 1) Preparation 2) Analysis 3) Design 4) Development 5) Implement and 6) Evaluation.

2. A t-test comparison of posttest and pretest of the experimental group students showed statistically significant difference at.05 level in creative ability.

3. The experimental group revealed that they were satisfied with a design system for electronic tale book with creative activities to enhance creative thinking of elementary school students

4. A design system for electronic tale book with creative activities to enhance creative thinking of elementary school students was presented as follows:



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The Development of Learning Centers in Virtual Worlds to Enhance Team Learning Ability of Lower Secondary School Students

Peerapat Chatsuwan, Noawanit Songkram

Chulalongkorn University, Thailand

0155

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Abstract

This paper is a report on the findings of a study conducted on the learning centers in virtual worlds model to enhance team learning ability of lower secondary school students. The methodology of this study was R&D research. The subjects were 27 lower secondary school students was an experimental group in Kanjanapisek Witthayalai Nakornphathom School in the academic year of 2012. The research instruments were a specialist interview form, team learning ability assessment form, learning achievement test, attitude questionnaire, learning centers in virtual worlds to enhance team learning ability. The data was statistically analyzed using mean, standard deviation, and dependent t –test.

The research findings discovered the learning centers in virtual worlds model to enhance team learning ability of lower secondary school students consisted of six components: 1) Learners 2) Facilitator 3) Instructional package 4) Activities 5) Learning centers 6) Virtual worlds. Six processes; 1) Introduction 2) Team building 3) Study 4) Knowledge sharing 5) Implementation 6) Discussion and conclusion.

Introduction

Team learning is one of the abilities expected by the society toward the youth. Actually, team learning is able to develop skills in relationships to each other, skill of communication, expression ability, understanding in learning process and knowing how to work with another (Michaelson, 2008) and to support the learning society to develop mankind as well as nation buildings. Lancaster and Strand (2001) indicated that team learning is to develop the student studying and group working for in term of social skills and elimination of conflict in leaning process.

Learning centers teaching method is the way to improve the development of team learning, by organizing of learning process for self-study and group process and must be prepared for comprehensive center, each center must be completed both content and procedure. The learner is able to visit all centers and participate those activities themselves according to their own interests under the supervision of the teacher. (Kammani, 2010) Students will be able to communicate and discuss in their team.

Learning in the virtual worlds is a presentation of data and material for learners to understanding the concept and social awareness. (Mathews and et.al, 2012). A performance of learning centers in virtual worlds is according to the learner's interest. The using of various multimedia is to create the concept of the learners in virtual worlds. All learners can get to the virtual worlds at the same time and place by using the "avatar" to identify themselves. It is facilitate team learning. Besides, it is a suitable for long distance learning for no limitation of time and place. Learners can use the facilitation without the limitation of time, place and expenses. (Malithong, 2005)

The researcher's opinion is learning centers in virtual worlds are an innovative in education. Therefore, the researcher is interesting in developing of learning centers in virtual worlds model to enhance team learning ability of lower secondary school students.

The objectives of this study

The purposes of this research were as follows:

1. to investigate components, processes and learning activities of the learning centers in virtual worlds model to enhance team learning ability.
2. to create the learning centers in virtual worlds model to enhance team learning ability of lower secondary school students.
3. to study the results of the learning centers in virtual worlds model to enhance team learning ability of lower secondary school students**.**
4. to present the learning centers in virtual worlds model to enhance team learning ability of lower secondary school students**.**

Hypothesis

The team learning ability posttest of students in the experimental group after learning by using the learning centers in virtual worlds model was higher than the pretest at the .05 level of significant.

Research questions

1. What components, processes and learning activities of the learning centers in virtual worlds model to enhance team learning ability of lower secondary school students?
2. Can lower secondary school students enhance team learning ability using this model?

Methodology

The learning centers in virtual worlds model to enhance team learning ability of lower secondary school students was R&D research. The methodology consisted of the following; the researcher

(1) Analyzed and synthesized information and research about components and processes of 3D virtual learning environment, learning centers teaching method, and team learning.

(2) Created the learning centers in virtual worlds model to enhance team learning ability of lower secondary school students with five experts monitoring this model.

(3) Studied the results of using the learning centers in virtual worlds model to enhance team learning ability with 27 lower secondary school students, Kanjanapisek Witthayalai Nakornphathom School, academic year 2012, was an experimental group. The subjects were similar in terms of age (ranging from 13-14). After trial, the researcher revised, modified this model and followed by considering and approving by five experts in the educational field.

(4) Presented the learning centers in virtual worlds model to enhance team learning ability of lower secondary school students in publications.

Instruments

Instruments of this research consisted of a specialist interview form, team learning ability assessment form, learning achievement test, attitude questionnaire, and the learning centers in virtual worlds to enhance team learning ability. The content validity of these instruments was obtained from three experts. These instruments were revised according to suggestion of the experts.

Experiment Stages

1. The subjects completed the pretest of the team learning ability assessment and learning achievement test prior to starting the processes of learning centers in virtual worlds model to enhance team learning ability with online learning and studying in the classroom.
2. The subjects performed instructional activities from learning centers in virtual worlds model for 4 weeks (9 hours) as follows:
   2.1 The instructor who participated in the research informed objectives, team learning principles and activities, assessment and evaluation to subjects.
   2.2 The experimental group students took the team learning ability and learning achievement pretest.
   2.3 The experimental group students participated in learning centers in virtual worlds processes which followed by team learning activities.

Processes	**Contents**	**Learning activities**	**Online/F2F**
1. Introduction	Selected topic for study and debate such as Traffic sign and symbol in the student's community area, How to driving safety, How to driving motorcycle, Safety on the road.	1. The instructor motivates student's interest. 2. The instructor gives orientation to the students. 3. Students register and login to the virtual worlds. 4. Students learn how to use virtual worlds.	 One and a half hrs.
2. Team building on Virtual worlds		1. Grouping the students as the team. 2. Each team set the roll of individual (i.e. Chairman, Secretary). 3. Each team set aims and planning by using online chat tools on the Virtual worlds.	 Half an hr.
3. Study by using Virtual instructional package		1. Students study the contents by using virtual instructional package on the virtual worlds. 2. Students practice individual test by using online quiz on the Virtual worlds.	 Six hrs. (four learning centers)
4. Knowledge sharing between team members by using chat		1. Each team discusses and shares the knowledge by using online chat tools on the Virtual worlds. 2. Each team practices the team test by using online quiz on the Virtual worlds. 3. Each team recalls the subject after team testing by using online chat tools on the Virtual worlds.	
5. Implementation by doing an assignment on virtual worlds		1. Brain storming from the student team to produce outcome by using online chat tools on Virtual worlds. 2. Each team makes an assignment on the Virtual worlds.	
6. Discussion and Conclusion		1. Total class is discusses and concludes that they have learned. 2. The instructor gives some feedback.	 One hr.
4 weeks (9 hrs.)			

3. The experimental group students completed the team learning ability and learning achievement posttest and answered the attitude questionnaire.

Data Analysis

After the experimental group students completed the team learning ability test and learning achievement test. The team learning ability and learning achievement was analyzed by using dependent t-test in Table 1 and 2.

Table 1: The results of means, standard deviation and a dependent t-test result the difference between the pretest and posttest team learning ability scores of the experiment group.

T-Test

[DataSet1]

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest1	3.3981	27	.82117	.15803
	Posttest1	4.2315	27	.80839	.15557
Pair 2	Pretest2	3.3611	27	.71649	.13789
	Posttest2	4.1944	27	.81813	.15745
Pair 3	Pretest3	3.3864	27	.65481	.12602
	Posttest3	4.3037	27	.66935	.12882
Pair 4	Pretest4	3.4115	27	.70665	.13599
	Posttest4	4.3025	27	.75710	.14570

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pretest1 & Posttest1	27	.240	.229
Pair 2	Pretest2 & Posttest2	27	.186	.352
Pair 3	Pretest3 & Posttest3	27	.238	.232
Pair 4	Pretest4 & Posttest4	27	.027	.892

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Pretest1 - Posttest1	-.83333	1.00480	.19337	-1.23082	-.43585	-4.309	26	.000
Pair 2	Pretest2 - Posttest2	-.83333	.98194	.18897	-1.22178	-.44489	-4.410	26	.000
Pair 3	Pretest3 - Posttest3	-.91738	.81734	.15730	-1.24071	-.59406	-5.832	26	.000
Pair 4	Pretest4 - Posttest4	-.89095	1.02143	.19657	-1.29501	-.48688	-4.532	26	.000

After using the process of the learning centers in virtual worlds model, team learning ability was analyzed by the dependent t- test and this found that there was a significant difference between posttest and pretest of the experimental group in team learning ability at the .05 (See Table 1).

Table 2: The results of mean, standard deviation and a dependent t-test result the difference between the pretest and posttest learning achievement scores

T-Test

[DataSet2]

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	achievementpre	8.7407	27	3.82896	.73688
	achievementpost	14.1111	27	4.56014	.87760

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	achievementpre & achievementpost	27	.500	.008

Paired Samples Test

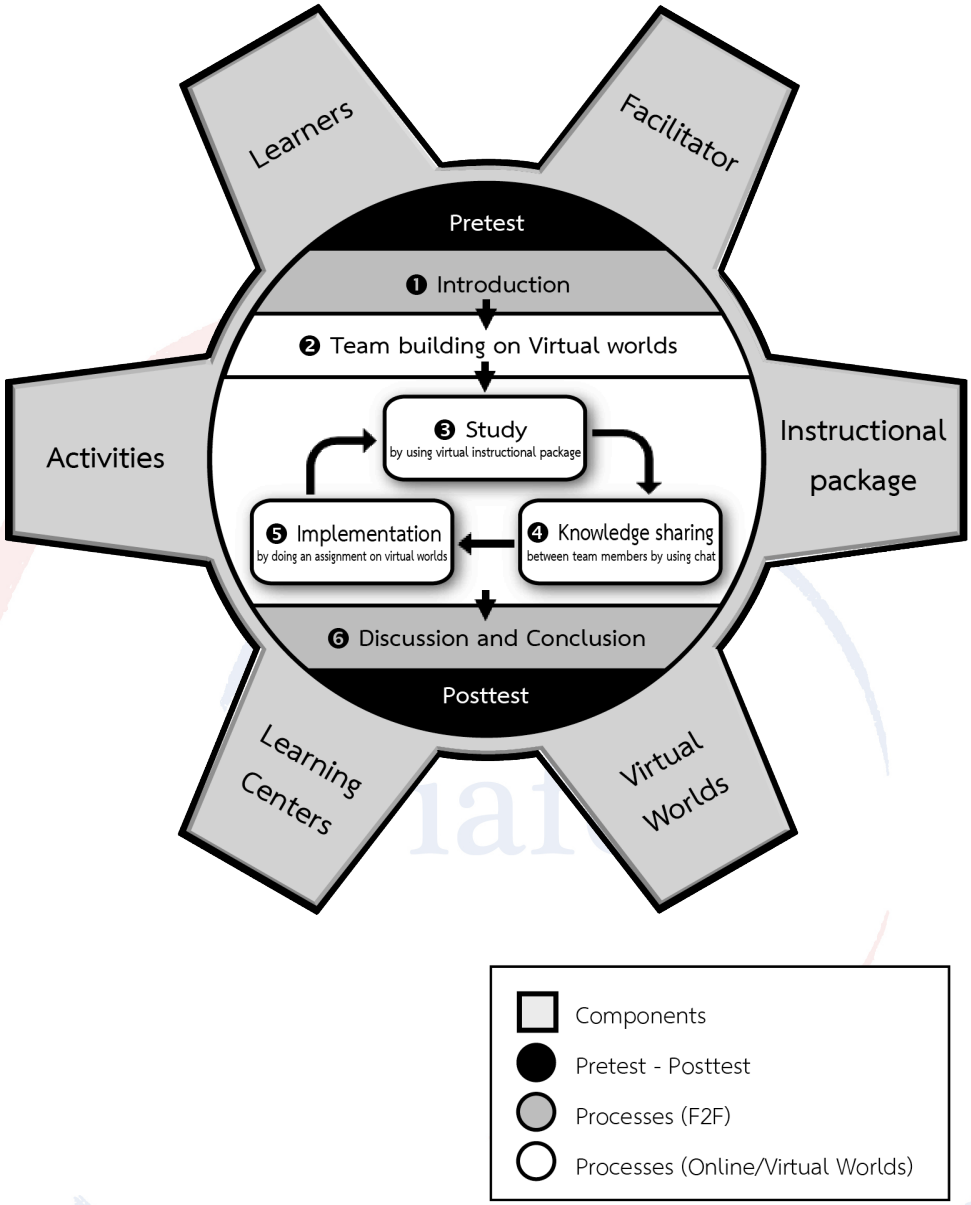
		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	achievementpre - achievementpost	-5.37037	4.24398	.81676	-7.04923	-3.69151	-6.575	26	.000

Learning achievement was analyzed using a dependent t-test and this found that there was a significant difference between pretest and posttest in learning achievement at the .05 (See Table 2).

Findings

The results of this study revealed that:

1. The experts' opinions agreed that the learning centers in virtual worlds model to enhance team learning ability consisted of six components: 1) Learners 2) Facilitator 3) Instructional package 4) Activities 5) Learning centers 6) Virtual worlds. The six processes consisted of 1) Introduction 2) Team building 3) Study 4) Knowledge sharing 5) Implementation 6) Discussion and conclusion.
2. A t-test comparison of posttest and pretest of the experimental group students showed statistically significant difference at .05 level in team learning ability.
3. A t-test comparison of posttest and pretest of the experimental group students showed statistically significant difference at .05 level in learning achievement test.
4. The experimental group students revealed that they were satisfied with learning centers in virtual worlds model to enhance team learning ability of lower secondary school students.
5. The learning centers in virtual worlds model to enhance team learning ability of lower secondary school students was presented as follows:



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E-learning for Campus District

I. M. Hwang, Ling-Chuan Tai, Wen-Ling Liu, Yan-Chi Liu, Jie-Ling Li

Chihlee Institute of Technology, Taiwan

0158

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Abstract

This paper chooses Chihlee Institute of Technology (CIT) as an example of e-learning platform to coordinates a wide range of services as a resource for life learning information outside of the classroom experiences through a website. CIT is located in Banciao District, New Taipei City, Taiwan providing students Bachelor's and Master's studies. This web site introduces excellent stores and restaurants in campus districts with lovely bird-view Store Image Maps. Store Members allows updating their own store information, item prices, and adding the advertisement. In order to bring the balance of Store opinions, Guestbook and Message Board provide an e-platform for sharing of students' comments between stores. Membership system allows members to rate and bookmark personal favorite stores.

The website also provides the district bird-view Campus and Street Map and real time public transportation information. Discount Area shares the discount information, useful group rates benefit, and offers some coupons available. Housing provides students e-resources of apartment renting around the campus area. Discussion Section and Chat Room are the concept of Web 2.0 allows users to interact and collaborate with each other.

The Campus District E-leaning website is http://140.131.84.199/district. For maximum quality, display resolution should be set at 1024×768. The website used many lovely characters and bird-view campus and street maps in order to attract attentions by making users feeling pleasant when viewing this website.

Keyword: *CIT, Image Map, Rate Store, Bookmark Store, Discount Area*

1. Introduction

E-learning is an approach for using internet on the classroom teaching. Via this approach, knowledge can be more flexibly propagated and absorbed irrespective of the teaching personnel and learners. Many schools and enterprises are adopting e-learning as their principal instruction or training method [Tucker]. This paper chooses Chihlee Institute of Technology (CIT) as an example of e-learning platform to coordinates a wide range of services as a resource for life learning information outside of the classroom experiences through a website. Chihlee Institute of Technology (CIT) was established in 1965 offering Bachelor degrees. It is located at a very lively Banciao District in New Taipei City, Taiwan. CIT has more than ten thousand students accessing the campus district everyday. A platform captures integrating with many school district resources becomes a very important for the energy and spirit with seamless real-time students engagement.

The E-learning for Campus District platform is a website that coordinates a wide range of services of CIT students and campus visitors, and serves as a resource for life information outside of the classroom experiences and opportunities. This allows easy access for users to obtain various foods and stores guidelines on one website. This platform provides some primary functions: Transportation, Store Map, Discount Area, Housing, Members, and Discussion. The Store Map provides e-learning services of restaurants and stores for students and visitors.

The website address is *http://140.131.84.199/district*. For maximum quality, display resolution should be set at 1024×768. In order to attract viewers' attention, the webpage graphic designer created many lovely characters and bird view campus and street maps.

2. The E-learning for Campus District Platform Approach

The development and popularization of internet application improved the reality of e-communication platform in recent years. The E-learning for Campus District platform includes different resources that can manage application functions. This E-learning platform provides five primary functions: Transportation, Store Map, Discount Area, Housing, Members, and Discussion. "Transportation" provides subway and the real time local bus information as the purpose letting students to catch bus at the station on time. The webpage graphic designer drew many lovely characters and bird view campus and street maps in order to attract attentions by making users feeling pleasant when viewing this website. "Store Map" indicates the location of local stores and restaurants on these lovely street maps. In the detail store information page, students are able to share comments written in individual store's Message Board where many great restaurants, various foods reviews, and affordable prices are recorded. The platform Members allow to rate the individual store and bookmark personal favorite shopping and eating spots. "Discount Area" shares the discount information, useful group rates benefit, and offers some online coupons available for local stores. "Housing" provides resident resource that students are searching for. "Members" contains user's profile and password, password retrieve, and bookmark My Favorite Stores. My Favorite Store allows members to bookmark their favorite restaurants and stores. "Discussion" is a concept of Web 2.0 allows users to interact and collaborate with each other in platform Discussion Section and Chat room.

As for system technical support, the platform uses Internet Information Services (IIS) as the web server and ASP.NET 3.5 as the web application framework. The database server is performed by SQL Server 2008 to organize and manage data. The webpage graphic designer used Ulead PhotoImpact X3 and Adobe Photoshop CS5 as

image-editing suites. The animation design was created by Macromedia Flash CS5. The webpage graphic designer drew many lovely characters and bird view campus and street maps in order to attract attentions by making users feeling pleasant when viewing this website.

2.1 The Platform Structure

The current platform of E-learning for Campus District access includes the Main Page, About US, Transportation, Store Map, Discount Area, Housing, Members, and Discussion. The current site map of E-learning for Campus District Platform is shown in Figure 1.

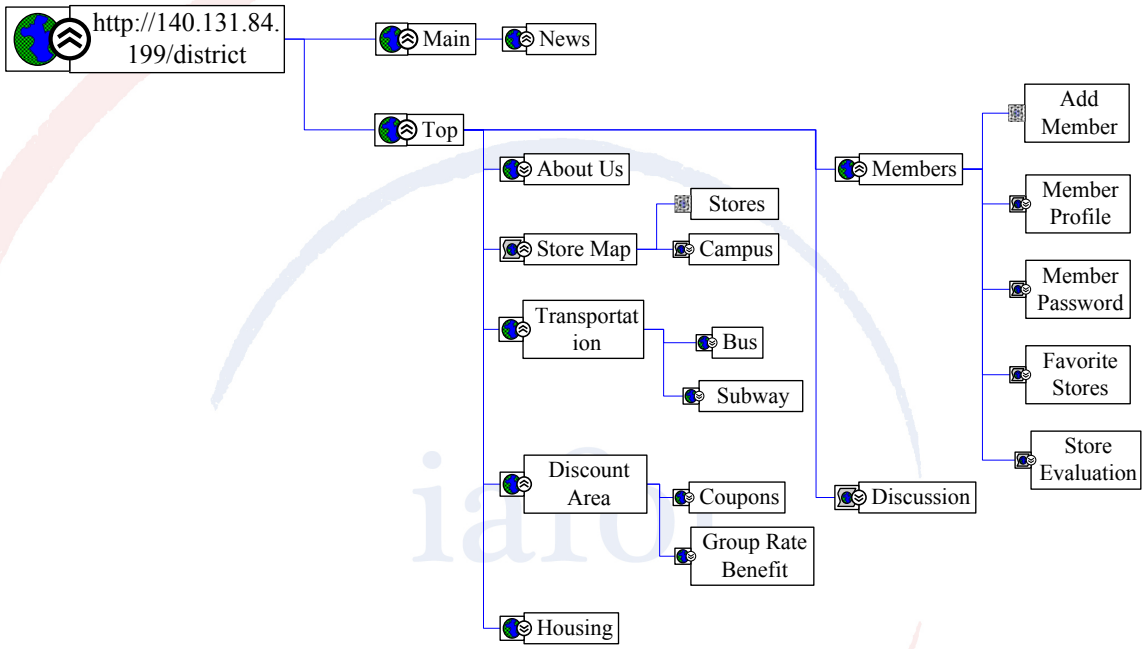

Figure1. The Site Map of E-learning for Campus District Platform

The "Main Page" contains Member Login, Add Member, and new activities and discount information. About Us introduces the motivation and purpose of E-learning for Campus District platform. Subway section provides the information of Scenic Spots near the district subway stations. It then subdivides these spots into small categories such as night markets, famous scenic spots, amusement parks, historical landmarks, humanities art, shopping malls, and etc.

2.2 The Flow Chart for Using the Platform

Figure 2 is a flow chart of using the platform of E-learning for Campus District. Visitors are not only allowed to view the Store detail information, public Transportation , and Housing resources but are also allowed to post messages in "Discussion" access and chat in the Chat Room. The Platform Membership system allows members to evaluate stores and bookmark personal favorite stores as well as posting their messages and comments in "Discussion" access. This platform also allows Store Members to update their own stores and prices information.

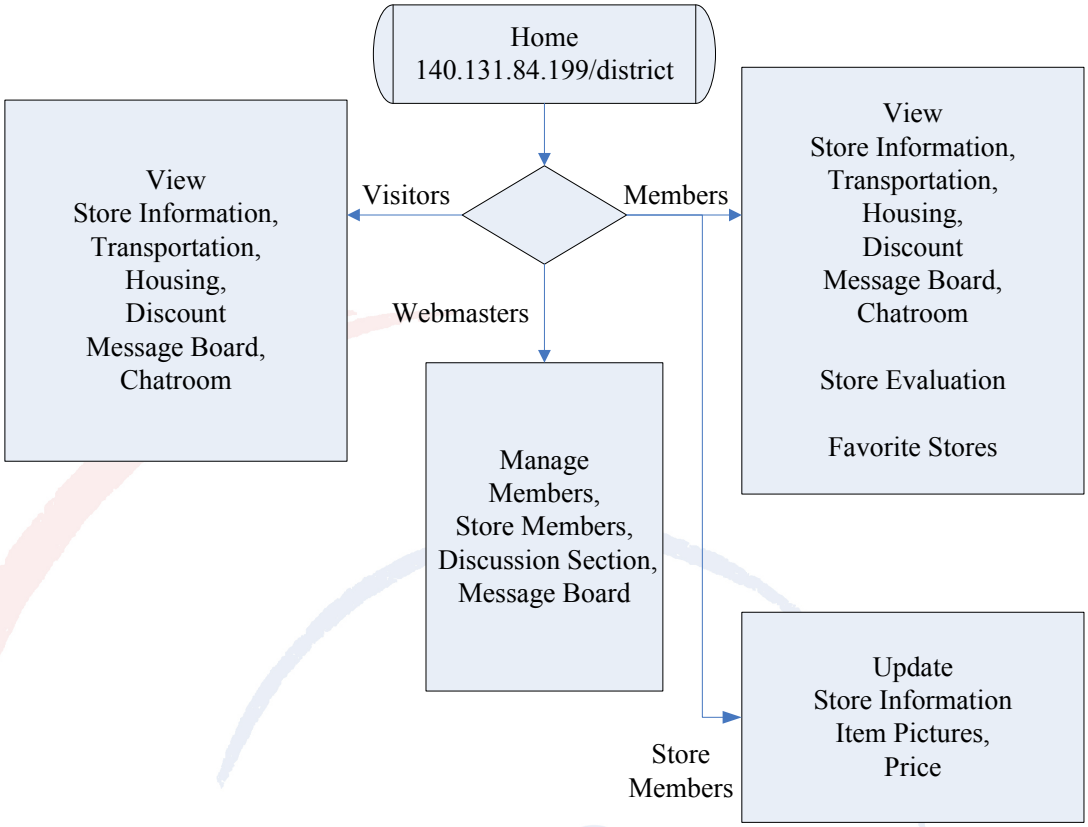

Figure2. The Flow Chart of Using the E-learning for Campus District Platform

Webmasters are also known as the website administrators of whom are responsible to answer questions as well as change and manipulate any comment or messages posted by members. Webmasters are also in charge of maintaining and developing the platform website.

3. E-Commerce, E-Learning, and E-Community Solutions

A key component of the e-learning platform is the use of technology to improve capability of CIT students and visitors to meet the needs of its campus district information with a goal of expanding the capabilities of all CIT campuses to better serve students, faculty, and campus visitors through the e-learning platform.
Internet has the ability to develop a conventional way on all aspects of e-commerce. The "Stores" under the Store Map section is the online platform for not only indicating the store location, but also providing the store detail information. Store Members allows updating their information, sale item or food pictures and prices, and even adding the advertisement in their own store page. In order to balance the individual store common opinion, members' comments and evaluation are also provided in the same page as for the reference. Students and users are able to learn and compare to choose the favorite store in this platform. Introducing more stores to participate the platform stores information is an important issue for future e-commerce and e-community development.

4. Platform Design, Management, and Maintenance

The platform website is a source for CIT students who is living and visiting Chihlee district. The Main Page of E-learning for Campus District platform is posted with new

activities and discount information that attracts website visitors to participate in these events. The website needs to be maintained regularly in order to keep it updated and trendy. More of the disadvantages of the online e-community management are that the members and enterprises have the lower search costs to easily compare the information from similar entities. Also, the members of the online community may expect more and more up-to-date information about products, orders, etc. [Fischer]. Therefore, the content of platform should be up-to-date and events on the website must be current.

Website visitors and members frequently contact webmasters directly via email or message board for answers to their inquiries. Webmasters are also known as the website administrators of whom are responsible to answer questions. Webmasters are also responsible for reviewing error reports and revising webpage bugs.

Protecting platform from losing data or moral reasons, the process of changing and manipulate any comment or messages posted by members as well as backup current data and historical web based evidence is a necessary step to severe consequences in potential security and legal battles. Preventing hackers from hacking member accounts and securing confidential information is also critical. Not only does this have a direct influence on the rating of the website, it can also result in lost of members if security is executed poorly.

5. Future Work

The purpose of the platform of E-learning for Campus District is to support learning by providing students, faculty, community members, and campus visitors with appropriate services from the platform website. Expanding the popularity of the platform of E-learning for Campus District will be continued to execute in order to increase members. One future objective is to expand popularity by raising the website search engine ranking. The technical aspects include containing the most important keywords from its corresponding page in the title bar and containing the most important keywords that potential customers would use to find this website on a search engine [Buresh]. Search engines picks up a lot of keywords and information on what people search for. Therefore, the analysis of visitors' most important keywords used on the platform still requires future work.

It is important that visitors also find what they are looking for to avoid visitors giving up the research or leaving the website. Another future objective is perfecting the experience for users that navigate the platform.

In order to retain visitor interest and regular visits of members, yet another future objective of the platform is that the website should be always up-to-date and enhanced with state-of-the-art features, contents, and events.

6. Conclusion

E-learning for Campus District drives students and campus visitors the opportunities using an online platform to comprehend the school district. This paper has given a detailed description and summarization of the platform of E-learning for Campus District, which integrates many campus living related functions into one platform. "My Favorite Stores" allows members to bookmark their favorite restaurants and stores. For retaining visitor interest and regular visits of members, the content of the platform website must be maintained regularly and always up-to-date.

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The Advantages of Using Technologies to Improve Reading Ability and Accessibility

Gregg McNabb

Shizuoka Institute of Science and Technology, Japan

0166

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Abstract

The application of technologies, particularly Moodle, to the so-called "traditional classroom" has transformed teaching, resulting in a new methodology, blended learning. Through it, students can be empowered to become more autonomous learners, while instructors can control aspects of the reading process that were formerly impossible.

This paper provides step-by-step details of how to integrate effective technology into reading development, using online speed reading, standard computer software and Moodle. This paper also indicates that by adding the Moodle e-learning dimension to the typical classroom experience, it is likely that some teachers will ensure that even weak learners will increase the time spent reading.

Key words: *speed reading, desktop capture, Moodle, autonomous learning, blended learning*

The Case for Going Online

Regarding the benefits of using level-appropriate short stories and authentic literature that were discussed at the ACTC Conference 2013, please refer to the first section of my article in *The Journal of Literature in Language Teaching* (McNabb, 2013a p.39-41).

There is a veritable explosion of available technologies for instructors who want to take students to the stage where they can independently or quasi-independently interact with all manner of texts, including actual literature. One obstacle, however, is that some educators frequently bristle when the topic of using technology is brought up. It can be a polarizing topic where "claims showing exaggerated 'awe' at a new technology's potential, are frequently matched by exaggerated 'fear'" (Bax, 2011). Usually this "fear" tends to be an unwillingness to try something new or a belief that valuable time will be wasted digitizing an already acceptable analog practice. At my own university, we have a state-of-the-art, custom-designed Moodle system with full training and support available to all instructors. Moodle is a powerful online Learning Management System (LMS) that can be used to complement regular classroom practices. In addition to empowering instructors to create and upload a plethora of different materials and courses individually or as part of a team, it lets them organise, observe and measure students' online course presence and performance. Our system is fully compatible with smartphones. However, despite our comprehensive training sessions, which include the ways the system can complement the traditional "chalk and talk" approach, after 2.5 years, the technology is only being used by ten professors, six of whom are in the English department. Yet our students are 21st century digital natives (Bibby, 2011; Prensky, 2005), many of whom do expect and appreciate an online or computer-based component in their courses, so it behooves us to embrace technology. By way of example, as of April 2013, two groups in the freshman cohort have been bringing their laptops to class without ever having been asked to do so. Embracing technology may have even more significance in Japan, where many institutions need to capitalize on every opportunity to differentiate themselves from their competitors in order to remain viable.

Nearly fifteen years ago, Porter (1999) presciently stated, "Technology can give students a greater degree of control over the delivery of their learning: by using technology, students can access information, learning spaces, and other resources at times which suit their lifestyle and their other commitments." She added that "Technology-based resources can be integrated into a course of study and used to complement classroom contact." We should also note that Bibby's research (2011) explained that students prefer to use their cell phones over computers for online activities. A further argument is that current smartphones and tablets are very smart indeed, as will become clear in the section dealing with implementing speed reading online.

It is very easy to find many suitable, well-known stories online such as at searchlit.org and www. short-stories.co.uk. All kinds of other authentic materials are also just a few clicks away. Thus, in addition to paper (still preferred by many), making a story or other materials fully accessible by putting it online has never been easier. These days most people have a phone, an iPad or a computer with them most of the time. This is especially true in the case of young people (Bibby, 2011). Therefore it is easy *and likely* that instructors will increase a student's contact time with the L2 by making

materials available online, particularly if the materials can be viewed on a smartphone. For the skeptical reader, the ample statistics gathered from weak learners, and detailed in the following paragraph, should validate these assertions. Even the very weakest students at my institution regularly access our Moodle site. It should be noted that according to the Japanese education ranking hierarchy, *all* students at this university are classified as weak. Therefore, even weak or very weak, mostly unmotivated students will use online materials.

According to the data from our Moodle server, in January 2012 there were 30,287 hits by 927 students. By January 2013, there were 112,129 hits by almost the same number of students. Students even continued to access the Moodle site in February, after the semester had finished. In February 2012 there were 3,492 hits and in February 2013 there were 5,209 hits. Finally, well after the end of semester, by the end of March 2012 there were 169 hits, all of which were in my short story section. As of this writing, by early March 2013, the same section has already received 104 hits. Indeed, we have found that after each semester approximately 60 students regularly access and reaccess materials during the semester breaks. As students have become familiar with the site and as our content has expanded and improved, usage has increased. On average, when classes are in session, our site gets approximately 60,000 to 65,000 hits per month, most of which are related to English courses. This seems to suggest that even weak students do not mind using online technology. Our students do not mind reading short stories online. This bodes very well for using certain technologies to improve students' reading ability. In addition, by using a Moodle website for reading short stories, instructors can better understand their students' habits because, when files are uploaded to a Moodle website, comprehensive data mining is possible.

I have already suggested above that some instructors are reluctant to adopt new technologies. This reluctance is usually out of fear that learning new procedures will be too complex or that preparing materials online will be too time consuming. In fact, the technology used to improve students' reading ability is easy to use except for the actual, original set up of a Moodle server, which does require specialized knowledge. While it is advantageous to use Moodle, it is by no means mandatory. Having made a case for going online, in the next section I will explain how to set up an online speed reading system, but the objective does not necessarily have to be speed reading. Using the system to improve reading fluency or even giving certain students a helpful push to read could be equally valid purposes.

Setting Up Speed Reading Online

First of all, instructors need to find a suitably interesting, level-appropriate story, such as those in my collection, *Fifteen Little Stories For English Language Learners* (2012). Ranging from about 800 to 1,800 words, these are low-intermediate, mostly light-hearted stories that focus on vocabulary development while not letting too many new words obstruct the goal of reading for pleasure. Once a reading has been found, they can save it for future use in Word or another common format. At this point, the instructors could upload it to their website as a stand alone file that students can access any time. Many are already doing this. For instructors who do not have a website, it is extremely easy, free and even enjoyable to create one at Weebly.com., which is totally compatible with current smartphones. There is also Weebly for Education, which is also free. Even without any website at all, instructors with a

Gmail account can upload files to Google docs, which is easy to access. Moreover, Google Forms is expanding, allowing for gradekeeping.

After a good website has been created, the next step is for instructors to practice reading the selected story at spreeder.com. Spreeder is free online speed reading software. It is extremely easy to use. My students were using it within five minutes. Before introducing students to Spreeder so that they can improve their reading speed, however, first, instructors need to familiarize themselves with it. At www.spreeder.com, paste the previously saved story into the window. After "spreed!" has been clicked, the story will appear according to the default reading speed (the default setting is 300 words per minute (wpm)). Spreeder parameters will likely need to be adjusted according to the complexity and flow of the story. Chunk size (the number of words to be viewed) can be changed according to students' levels. For example, five-word chunks will be appropriate for one story, but six-word chunks may suit another. 135 wpm might be suitable for Hemingway's "Old Man at the Bridge," but perhaps only 100 wpm would be optimal for *The Very Hungry Caterpillar*. It is possible to set font size, colour, background, alignment, and window dimensions. There are even several, simple "advanced" settings, such as adding a slight pause at the end of sentences and paragraphs.

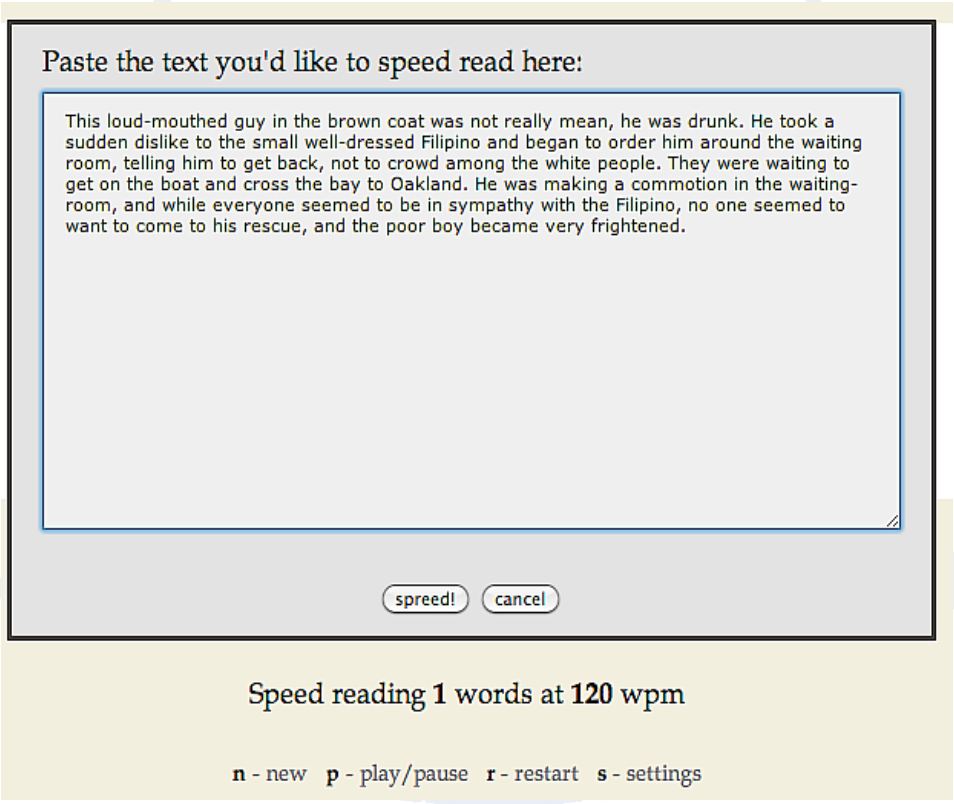

Figure 1. Pasted text in the Spreeder window

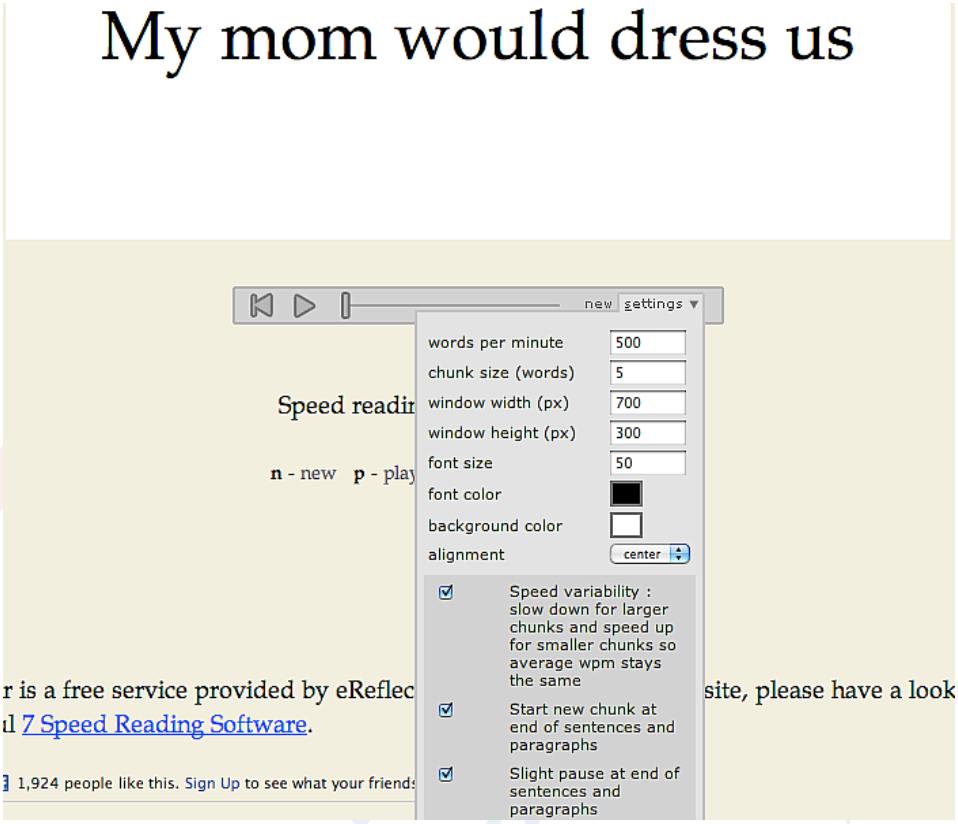

Figure 2. Setting Spreeder parameters

Once instructors have learned how to use Spreeder, they will show students what to do. After students have been instructed how to use Spreeder, they should be encouraged to read the story again and again until reading becomes automatic at a particular rate. I have found that reading and rereading individual paragraphs, as opposed to reading the full story, is preferred by weak readers. Setting targets of reading X times per week at X wpm will put some positive stress on students to strive to attain a goal, but this should be balanced by free reading opportunities, so that "reading" does not deteriorate into to a set of tasks assigned by the instructor. Depending on the students, an element of competition could be introduced by rewarding those who improve their reading speed the most by setting a challenging wpm target. The main objective, however, should first be to improve automaticity in reading.

By using his computer in class, an instructor can follow up on students' progress by having them read in class from a large screen or monitors. This is good pedagogy in that *the instructor* can set the pace. In particular, even reluctant readers will be forced to read in chunks for 2-3 minutes, instead of word by word for 20 minutes. Actually, it is a very positive thing to demonstrate to such readers that they are reading multiple times faster than they do normally and that they are mostly "getting" what the chunks and the story mean. Krashen's testing in Lao and Krashen (2000) and my own experiences in the classroom bear this out.

Since I put all of my comprehension questions on our Moodle site, I can determine how well students have understood a story by looking at the overall Practice Quiz

results and can even perform item analysis of individual questions. Because they are Practice Quizzes that can be attempted endlessly for a small percentage of their total grade, normal students tend to do them without extensive preparation, but they still do make an effort to answer, which is different from some very weak students who enter the quiz merely to find out what the questions are. As a result, the first few attempts of normal students tend to reflect their actual understanding of the story. Sometimes these data give me insights into what parts or aspects of a story are problematic and therefore need to be addressed in class. To this point I have explained how to conduct silent reading and control the pace or let students read on their own using technologies, but where there is mild pressure to read faster.

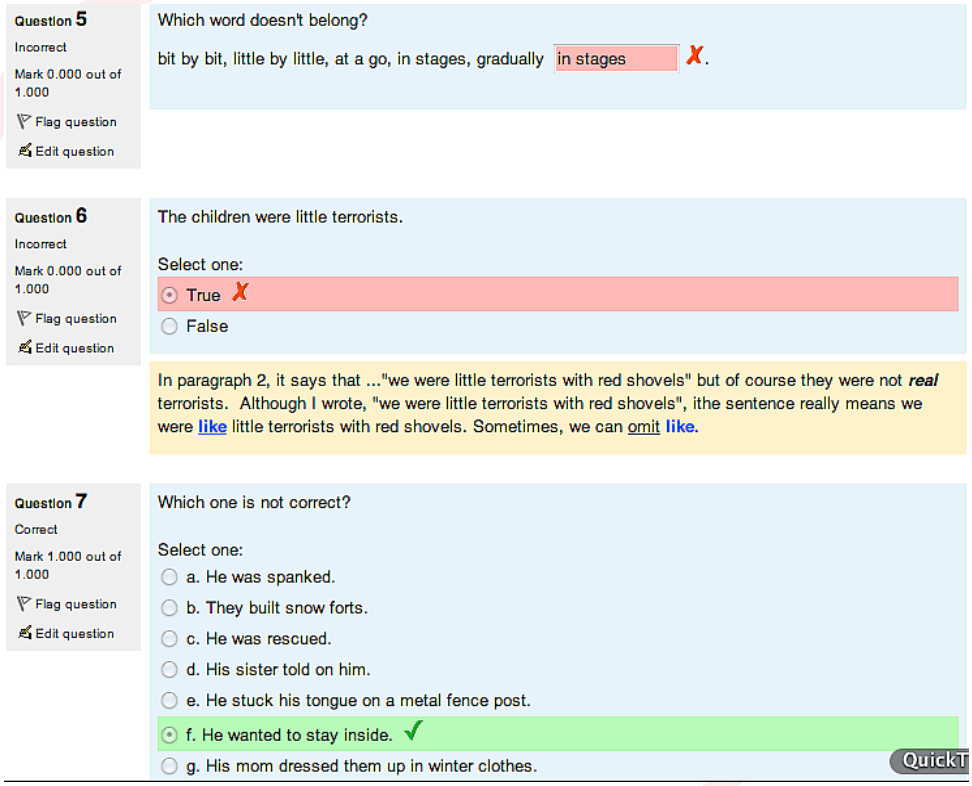

Figure 3. Using Moodle testing for evaluation and feedback

The last stage is to introduce an oral component. The story file should be printed out in a font size that is easy to read. Next, at Spreeder the story needs to be pasted into the window with the desired settings and then read aloud several times. There will be hesitations and difficulties, so being able to refer to the printed copy helps to produce a more polished reading. Once the story can be performed smoothly, a desktop capture application such as QuickTime needs to be opened to make a YouTube style video of the reading while using Spreeder. Most newer computers have desktop capture capability. If not, it is relatively easy to download an application. First, the story should be pasted into Spreeder, ready to be read. This should be on a tidy desktop so that the finished product will not appear cluttered and unprofessional. Then a desktop capture application needs to be opened to record the instructor reading the story on Spreeder. Procedures will vary slightly according to the operating system on the computer, but using a MacBook Pro with QuickTime 10.0, QuickTime 10.0 must be opened. Then after selecting “New Screen Recording” from the drop-down File menu, the reading should be practiced several times for at least 20 to 30 seconds.

First, click the "Record" button and then click on "spreed." A video of the reading will be made. Next, the file(s) should be played back, evaluated and redone if necessary. Next, the entire story can be read or as much as is appropriate for the students. As described in the preceding section, this file (usually in mp4 format) can be uploaded to a website or to Google docs. Students will be able to read and listen to the story at the wpm rate set by the instructor. Of course they can read it silently, too, by turning down the volume. It is possible *and preferable* to upload several files of the same story using different wpm rates so that students can challenge themselves. Since not all students read at the same rate, different wpm rates will help more students.

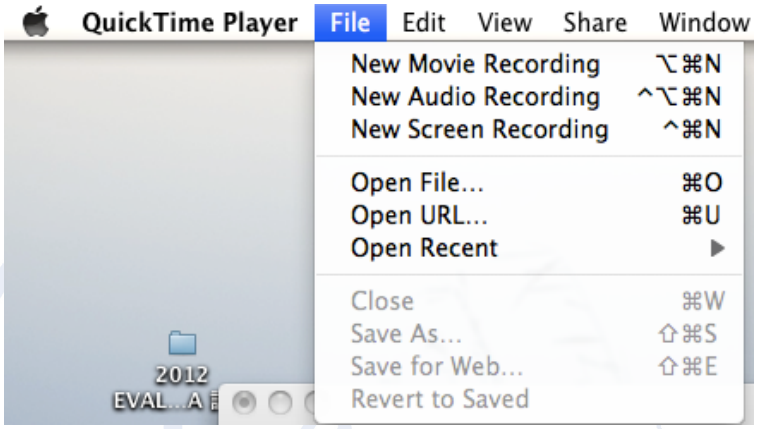

Figure 4. Opening QuickTime to make a New Screen Recording

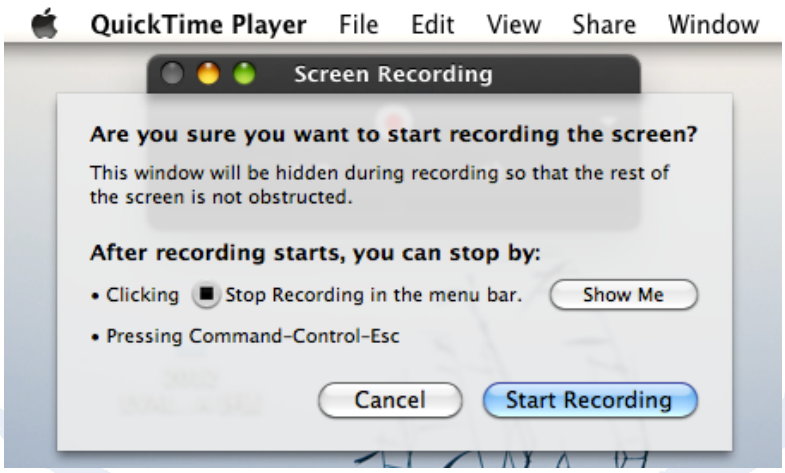

Figure 5. Beginning a screen recording (of the Spreeder window)

Although this explanation may seem onerous in print, actually creating the videos is easy. If good readings are made, they can be reused for many years. If the files are uploaded to a Moodle site, when and how many times each student used each file can be checked. If instructors can succeed in getting students to use Spreeder often, the same as with other solid speed reading programs, there will be improvement. It is also possible to have students record their own reading and submit it as e-homework.

By making story files available online and introducing Spreeder, at the very minimum

it will be easier for students to use their smartphone or computer to read whenever and wherever they want. Most likely, however, a whole new dimension to teaching reading will be added because traditional classroom practices will be reinforced and complemented when students are able to read and listen to authentic materials numerous times. When various types of comprehension questions are put online that can be accessed at any time, students will be able to check their understanding. Instead of spending just 90 minutes a week in classroom reading and study, students will likely engage with the materials more often, as has been shown above

Conclusion

There is no need for instructors to eschew online technologies due to their perceived lack of confidence. It has been demonstrated that it is neither difficult nor especially time consuming to adopt powerful new technologies that enhance students' reading opportunities. Blended learning, which combines traditional classroom practices with new e-learning technologies, has never been easier. By offering students enjoyable, manageable materials to read and simultaneously hear via new technologies that they can control according to their own schedules, we are moving forward to create what is expected to quickly become the new paradigm for teaching reading, one that will, hopefully, increase students' interest in reading literature and a wide variety of other materials for pleasure, in addition to reading for course credit.

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The Synthesis of an Online Collaborative Learning Model Using Multiple Intelligences Groupings with the CIPP Model for Evaluation

Pramote Tongchin, Monchai Tiantong

King Mongkut's University of Technology North Bangkok, Thailand

0167

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Abstract

This research aimed to synthesize an online collaborative learning model using multiple results, the synthesized model consisted of 11 modules as follows: 1) MI Test module 2) GPA module 3) MI Matching module 4) Subject Database module 5) Analytic Content module 6) Introspective Content module 7) Interactive Content module 8) STAD (Analytic) module 9) STAD (Introspective) module 10) STAD (Interactive) module, and 11) CIPP module. Each module has different functions to support an online collaborative learning model using Multiple Intelligence for groupings. Moreover, CIPP was used for the evaluation. The results on the appropriate synthesized model by expert found that it was at a good level (Mean = 4.47, SD. = .52). In conclusion, this approach can be used to synthesize model properly for the next phase.
Keyword: *Collaborative, Multiple Intelligence*

1. Introduction

Since the Thai National Education Act B.E. 2542 (1999) was announced, the structure of education administration in both local and central areas was reconstructed. All education and management was centralized under the supervision of the Ministry of Education. The educational service area was used in local educational management. Moreover, educational processes were also changed; teaching methods were student-centered instead of classical education. It can be addressed that Thailand education reform is continually changing [1].

The learner-centered concept can be applied with learning theory in teaching. The learning theory describes that people learn from one another [2].The examples of learning theory are collaborative learning techniques, and Multiple Intelligences theories [3].The idea of collaborative learning and working together to exchange ideas is considered an important method to obtain knowledge. Learners can develop the type of intellectual exchange that fosters creative thinking and productive problem-solving [4]. Gardner's Multiple Intelligences theory can be used in any topics of subject in both basic and higher education. The purpose of this learning method was to create personal competitive learning [5].

The Multiple Intelligences (MI) theory of Gardner demonstrates that human intelligence is multifaceted. Gardner asserts that this theory can be applied to every characteristic of learners [6]. The Multiple Intelligences can be grouped into 3 domains [7] as follows.

1. Analytic domain is the Multiple Intelligences groups that focus on thinking and analysis.
2. Introspective domain is pointed at imagination and understanding.
3. Interactive domain is aimed at communication and interpretation.

The Multiple Intelligences Learning Activities (MILAs) are classified as presented in Table 1.

Table 1: Learning activities in Multiple Intelligences

Multiple Intelligence	Learning activities
Analytic	Simulation
	Acquisition
	Practice
	Case study
Introspective	Acquisition
	Questioning
	Practice
	Case study
Interactive	Discussion
	Acquisition
	Questioning
	Case study

The theory of Multiple Intelligences [8, 9] is the theory that can be used to understand learners' capabilities, skills, learning method, preferences and strengths. The MI can be stated that it is a useful ways to better explain the needs of students. The questionnaires showed that this model was interesting to students and their parents.

At present, MI teaching method does not cover all domains in some subjects. The groups of MI domains were set as a guideline for teaching. Therefore, the researchers concerned in synthesizing the online collaborative learning model using Multiple Intelligences groupings with the CIPP Model for evaluation. The findings can be generated by the MI learning model to find the appropriate learning activities and assist students to increase their strengths.

2. Objectives of the research

2.1 To synthesize an online collaborative learning model using Multiple Intelligences groupings and use the CIPP Model for evaluation by 10 experts focusing on group discussions.

2.2 To evaluate the satisfaction toward the synthesized model by 5 experts using evaluation questionnaires.

3. Scope of research

3.1 The synthesis of this online collaborative learning model was performed under the supervision of 10 experts using the focus group to present the discussion and conclusion.

3.2 Five experts participated in evaluation of the online collaborative learning model using Multiple Intelligences groupings and used the CIPP Model for evaluation.

3.3 The experts in this study had the qualifications as follows: holding a doctoral degree, or having an academic position, or experienced in educational or online teaching dissertation adviser, and having at least 2 years work experience.

3.4 This study was conducted in the first semester of the 2012 academic year.

4. Methodology

The research processes were separated into five steps: 1) examination of related literature, 2) interviewing the experts, 3) synthesis online collaborative learning model using Multiple Intelligences groupings by using focus group discussions, 4) evaluation of the synthesized model online collaborative learning model with the CIPP Model, and 5) design and development. The methods are presented in more detail in the following sections

4.1 The related literatures such as Multiple Intelligences, collaborative learning, the development of research instruments and software, and Thai National Education Act from both national and international sources were reviewed.

4.2 In interviewing, related literatures were reviewed for structured interview construction. The focus group was utilized to collect data from 5 experts for conceptual framework to synthesis the online collaborative learning model using Multiple Intelligences groupings with the CIPP Model for evaluation.

4.3 To synthesize the online collaborative learning model, the researchers appointed 10 experts to conduct the focus group discussion to find the appropriate online collaborative learning model using Multiple Intelligences groupings with the CIPP Model for evaluation.

4.4 To evaluate the satisfaction toward the online collaborative learning model using MI groupings, the related papers were submitted to 5 experts for assessment of each domain which can be used in teaching and enhancing learning outcome.

4.5 The experts' suggestion was developed in construction of this model. The model framework and modules' details were created.

5. Summary of research

5.1 The synthesis of the online collaborative learning model using Multiple Intelligences groupings with the CIPP Model for evaluation was composed of 11 modules as follows:

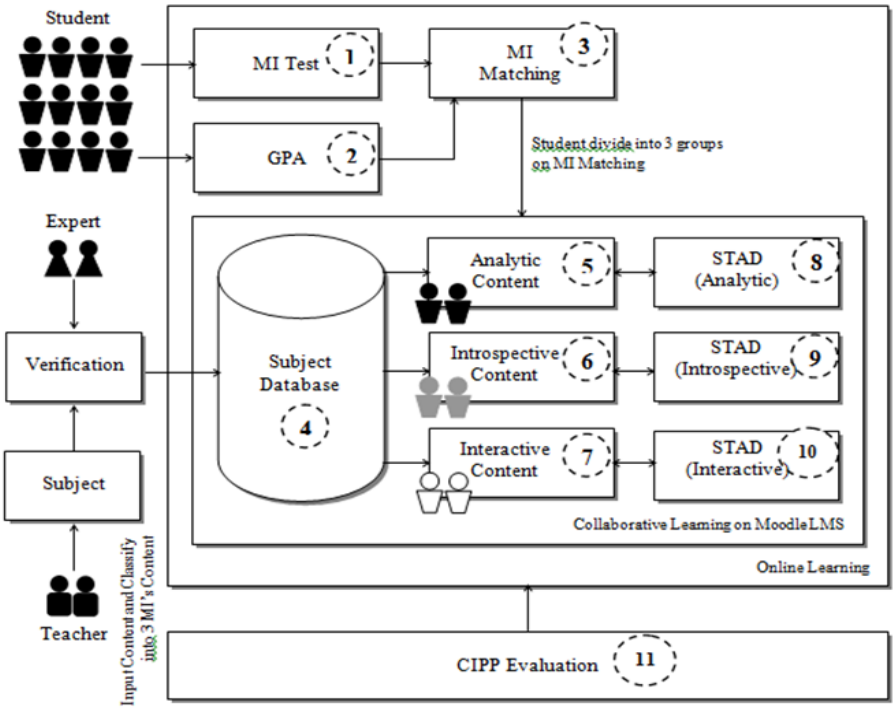

Figure1. Synthesis of model frame work

5.1.1 Multiple Intelligences (MI) Test Module: this module provided MI test for each learner. Then, the test result was grouped into 3 groups: Analytic, Introspective, and Interactive, respectively.

5.1.2 GPA Module stored the Grade Point Average (GPA) of each online log in students to rank in the Module MI Matching.

5.1.3 MI Matching Module divided learners into 3 groups by matching their MI potential with GPA. The GPA was separated into good, moderate, and weak.

5.1.4 Subject Database Module was the data base that accumulated learning lessons and learning groups from the verification of expert in each subject that created by teachers to support the MI groups: analytic, introspective, and interactive.

5.1.5 Analytic Content Module arranged contents and learning groups to suit with the analytic MI skills of learners. The analytic focused on thinking, and questioning which consisted of 1) Logical-math Intelligence, 2) Musical Intelligence, and 3) Naturalistic Intelligence.

5.1.6 Introspective Content Module provided contents and learning instruments for each learning group which was matched with the introspective domain. This introspective emphasized on the mental imagine and understanding composing of 1) Intrapersonal Intelligence, 2) Visual-spatial Intelligence, and 3) Existential Intelligence.

5.1.7 Interactive Content Module set matches the content and learning groups to the interactive domain. This domain focuses on communication and interaction skills which were Linguistic Intelligence, Interpersonal Intelligence and Kinesthetic Intelligence.

5.1.8 STAD (Analytic) Module manipulated the STAD collaborative learning activities such as competition and reward that conformed to the Analytic domain. The learning activities were simulation, acquisition, practice, and case study.

5.1.9 STAD (Analytic) Module operated the STAD learning activities in the introspective domain. The learning activities were acquisition, questioning, practice, and case study.

5.1.10 STAD (Interactive) Module managed the STAD learning activities such as competition activity and rewarding. The interactive domain activities were acquisition, questioning, practice, and case study.

5.1.11 CIPP Model Module was applied in evaluation of 4 concepts: context, input, process, and product. The context and input were exploited in evaluation structure of lesson by IOC. Questionnaires and experts were used in matching the lesson with learner Multiple Intelligences. The process was measured by leaning outcome. In addition, the output was performed by construction of questionnaires to measure skills and capabilities of teachers and students. Then, the conclusion was made.

5.2 The evaluation results of online collaborative learning model using Multiple Intelligences groupings are presented in Table2.

Table 2: Evaluation of model

Module	$\overline{X}$	**SD**	Meaning
1. MI Test Module	4.20	.45	High
2. GPA Module	4.20	.45	High
3. MI Matching Module	4.40	.55	High
4. Subject Database Module	4.60	.55	Very high
5. Introspective Content Module	4.40	.55	High
6. Introspective Content Module	4.40	.55	High
7. Interactive Content Module	4.40	.55	High
8. STAD (Analytic) Module	4.60	.55	Very high
9. STAD (Analytic) Module	4.60	.55	Very high
10. STAD (Interactive) Module	4.60	.45	Very high
11. CIPP Model Module	4.40	.55	High
Total	**4.47**	**.52**	High

6. Summary

The aim of this research was to synthesize the online collaborative learning model using Multiple Intelligences groupings and used the CIPP Model for evaluation. The findings demonstrated the framework which was formed by 11 modules are as follows: 1. MI Test Module, 2. GPA Module, 3. MI Matching Module, 4. Subject Database Module, 5. Introspective Content Module, 6. Introspective Content Module, 7. Interactive Content Module, 8. STAD (Analytic) Module, 9. STAD (Analytic) Module, 10. STAD (Interactive) Module, and 11. CIPP Model Module Subsequently, the model was nominated to five experts regarding the appropriate and structure. The score is presented at a high level (X= 4.47). Therefore, it can be concluded that this online collaborative learning model can be employed and contributed to the enhancement of learning outcome. Further study is required to fully consideration the implications with teaching.

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Web-based Learning and Web Mining

Peter Toth, Imre Rudas

Obuda University, Hungary

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Introduction

The application of a virtual learning environment has become widespread in Hungarian higher education. Questions of quality and adaptivity are increasingly gaining dominance, manifested in course development and course management which takes the individual specialities of learners well into consideration. In order to increase the adaptivity of the learning process, we need to have exact and relevant information on the learner's learning characteristics and preferred learning strategies in an online environment. In this we may be aided by web mining methods, which process data from interaction between the learner and the learning objects.
There are two kinds of procedure to be followed in selecting the appropriate online teaching strategy. The top-down method involves the identification – usually by an online questionnaire - of the learner's learning style first, then, on the basis of this, we can conclude the preferred learning strategies and, from these, the learning methods, means and forms. The other possibility is the so-called bottom-up method, when we proceed just in the opposite direction by starting with the patterns of concrete learning activities – by using for example methods of web mining -, arrive at conclusions on learning characteristics and preferred learning methods, on the basis of which learning strategies are relatively easy to identify. Now to the learning strategies preferred by the individual already recommended methods of syllabus processing, learning routes, individual course management methods as well as tutorial methods may be assigned.
Therefore by the application of web mining methods as inductive examination procedures certain cognitive processes, strategies, learning characteristics are to be deduced and special learning habits and difficulties are to be isolated and typified. In the context of syllabus developer – tutor – electronic syllabus – learner two kinds of syllabus developing processes are collated. The learning process conceived and formed by the developer and the tutor on the one hand, and the one as finally realized by the learner on the other. The simpler a learning route, the simpler its inner representation. In other words, the more complicated it is, the more time its conception, discovery, understanding and recording takes. The simplest possible cognitive network which is repeated at all learning objects demands the least possible concentration on the part of the learner in the course of navigation, therefore emphasis falls on the acquisition of information located in the clusters.

1. Adaptive e-learning and web mining

The distinction between web mining and data mining was made as early as in 1997, however, it only became a field of research in its own right over the last 10 years. There are two approaches to the interpretation of web mining. The process-oriented theory regards web mining the sequence of successive tasks (Etzioni, 1996), whereas the data-centred concept discusses different web mining methods according to the types of the web data analysed (Cooley et al., 1997). It is rather the second approach that has become more accepted, according to which web mining is a special area of data mining, applied for analysing data created on web servers, that is web content mining, web structure mining, web usage mining are to be discussed. A popular synonym for web mining is the expression 'knowledge discovery in web databases', too. The work of Kosala and Blockeel (Kosala and Blockeel, 2000) presents an overview of research into this field up to the year 2000. The study by Srivastava and colleagues also deserves attention, investigating the behaviour of users, mostly

consumers, at web portals which satisfy great user demands such as Amazon.com, Google, DoubleClick, AOL, eBay, MyYahoo or CiteSeer (Srivastava et al., 2004).
From the point of view of our research their endeavours made to identify web metrics and measurements (e.g. visits to pages, visit-purchase rate), to analyse click-streams describing the decision-making process (click-stream analysis) (e.g. the process between entering the web store and purchasing or in fact failing to do so) and to investigate the time factor of web communities, contents and structures are to be highlighted in their work.
The application of web mining to examine activities of online learning is a quite special field. Desikan and colleagues used web mining methods for investigating the efficiency of self-directed e-learning (Desikan et al., 2006). In connection with Desikan's self-directed e-learning we may arrive at three statements with regard to our research. Firstly, the hierarchy of concepts explored in the course of content analysis does not necessarily reflect the appearance of the information on a web page, however, it may still be useful for context and search circumstance analysis. Secondly, the collation of navigation hierarchy created by the planner („expert") and the route actually realized by the learners („beginners") may provide interesting information as to the discovery and comprehension of online learning methods as well as strategies and also to course development. Thirdly, web mining is suitable for modelling the navigation behaviour of the learner, too.
Khribi and colleagues still look upon the personalization of virtual learning environment, that is the consideration of the learners' special characteristics both in the course of planning and learning management an as a problem unsolved. That is why they pose the question of an adaptive course management, by which they mean a dynamic restructuring of the course, the adaptive selection and personalized composition of the learning objects as well as an adaptive navigation support. Their adaptive e-learning flow-model can be divided into two phases. In the course of modelling (offline mode) at the formation of the e-learner profile they take into account information gained for example from the interaction between learner and learning environment (eg preferred learning objects, learning routes), the existing knowledge of the student, his learning characteristics and style. This is followed by the formation of homogenous groups of e-learners with similar learning characteristics through the application of cluster analysis and associative methods (typifying). In the phase of counselling (online mode) first the observation and analysis of the learning activities of the learner who is just being active in the course takes place along the parameters mentioned in connection with modelling, then the learner is assigned to the group with the same learning characteristics as his. After this propositions concerning learning objects and learning routes are made through the application of filters focussing on syllabus content as well as collaborative activities (Khribi et al., 2009).
A similar model of the formation of a personalized electronic learning environment is to be seen at Jain and colleagues, too, who created an adaptive system by using means of the semantic web as well as web mining. In their model learning objects most suitable for the individual characteristics of learners are selected through the application of so-called personalized e-learning services from standardized content packages, thus creating the so-called personalized electronic learning environment (Jain et al., 2012).

2. Examined course, applied methods and research objectives

It was the course implemented in a virtual learning environment (Moodle) of a subject taught in professional teacher training, educational technology and multimedia, that formed the object of the examination. Students taking part in correspondence courses learn the aspects, methods and means of the development of information media (overhead projector foil, video film, photograph, chart, animation, computer presentation, etc) and the use of educational technological aids applicable in the course of their pedagogical work (e.g. overhead projector, video projector, document camera, camera) within the frame of this subject.

An increase in the dynamically changing syllabus content and a decrease in contact lessons necessitated the development and later the application of electronic syllabus in this subject. As a result of the development a four-module (basics of educational technology, digital imaging, image editing, video editing) multimedia based interactive electronic syllabus was created, which, besides the introduction and application in pedagogy of education technological tools, drills the process of the development of information media, that is, the acquisition at a skill and proficiency level of editing programs is highlighted.

Congruence with this dual objective was also reflected in setting the electronic format syllabus content. For the acquisition of information photos, images, texts (written and narrative), animation, and video, while for the introduction of editing algorithms animation supported by narrative explanation and videos were integrated in the electronic syllabus.

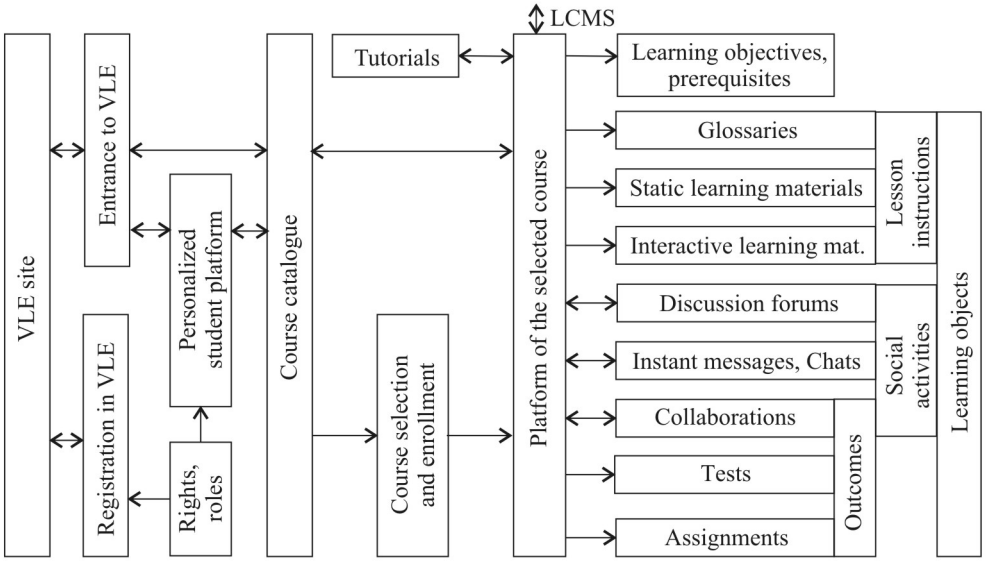

Fig. 1 The model of the educational technology and multimedia course

Besides the electronic and interactive syllabus contents further objects that support studies were applied in the course, for example discussion boards, wiki and dynamic glossary. Along with that the knowledge of learners was measured through online tests and the solution of productive tasks.

The theoretical model of the educational technology and multimedia course is shown by figure 1, whereas its concrete interactive syllabus structure is represented by Table 1.

Interactive syllabus objects (modules)	Syllabus units (sub modules)	Number of screen pages
The basics of educational technology	1.	13
	2.	18
Digital imaging	1.	22
	2.	18
	3.	12
Digital image editing	1.	18
	2.	16
	3.	12

Table 1 The structure of interactive syllabuses

In the course of the examination the CRISP-DM model known in data mining was applied, which is also well usable in analysing through web mining the database formed in applications for educational purposes.
It, however, must be taken into consideration that with respect to a particular course a relatively significant scale, repeated sequence of activities by a relatively small number of test persons is to be taken into account, which in turn makes the generalization of experience difficult.
From among the methods applied during the examination accounts provided by the statistical system of Moodle and in data mining the frequency, sequence and cluster analysis and that of prominent values, classification and associative procedure are to be highlighted.
Data mining procedures appropriate for analysing online courses and results of their application are treated in several researchers' works (Ai and Laffey, 2007; Romero, Ventura and García, 2008; Lu, 2004; Tang and McCalla, 2005).
In the course of the research SPSS (IBM) Modeler (Clementine) program and its Web mining node was used, which offers concrete algorithms to realize the data mining methods mentioned above.
For an interpretation of the results of the examination three basic concepts must be made clear. The learner interacts with the screens of the course and its learning objects with the purpose of learning (e.g. opens, downloads and uploads a page or a document, does a test, contributes to the discussion board). So the interaction is to be interpreted at the level of screen pages (php, html, xml), probably files or their larger units, that is events. Therefore analyses focussing on *click-streams* or *learning events* (e.g. submitting assignments, activity at forums, wiki-notes) can be distinguished. During a particular visit – from entering the course to leaving it – the learner opens several screen pages, gets into contact with several learning objects and performs a full sequence of operations. The examination directed at click-streams is called microanalysis whereas the one directed at learning events (objects) is called macroanalysis.
All the operations by the learners are administered in the so-called logfile. During the processing, to these notes in the logs User ID, Visit ID and Event ID are assigned, which makes *segmentation* according to learners, visits and events possible. The date of the operations performed is also recorded, that is tracking the activity of learners in the course is easily solved.

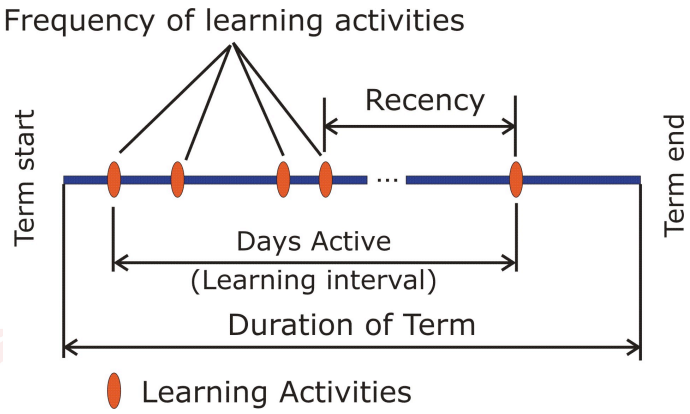

Fig. 2 Variables of online course frequency analysis

On the basis of the successions of learning activity as well as of the frequency in time of the visits a notion may be formed of the learning methods and strategies. Also, a collation and typifying of visit habits can be realized.

Three variables were introduced for the *frequency analysis* of the online course. „Days Active" means the time lapse between the learner's first and last visit to the course, „recency" denotes the number of days that passed since the last visit, while learning „frequency" refers to the number of visits during the time interval under examination (Fig. 2).

Our examination belongs to the category of web usage mining since our objective is the analysis of visit structure, click-streams and learning activity as well as the identification of learner habits, methods and strategies.

Based on the above we looked for an answer to an open question: *Is it possible to draw conclusions of learning characteristics and preferred strategies from the patterns of online learning activities, that is from the order and frequency of student interactions?*

45 persons (28 men and 17 women), students of a correspondence course in engineering education participated in the research. Their specialisations were as follows: 8 mechanical engineers, 16 electric engineers, 6 information technology specialist engineers, 6 light industry engineers and 9 technical managers. With the exception of 4 of them they all teach at vocational secondary schools. The average age of the group is 39.68 years with the youngest person being 27, while the oldest one 58 years old. 16 of them teach in Budapest, 12 in a city and 17 in small towns. 49.17% of the people in the experiment use an IT device in class regularly, 27.69% do so often, while 23.14% rarely. Use mostly refers to a computer presentation, therefore the devices applied are usually portable computers and projectors. It is mainly in the preparation for the class (56.47%) and in communication (76.35%) that IT devices are used outside class. All the persons in the experiment own a computer at home with all but 3 of them with Internet access.

4. Results

The answer to the above formed question is to be given by an analysis of the learning activities (segmentation of visits by learners or events as well as their temporal analysis).

Our examination may focus on either learning objects (to these learning events such as for example forum activity or submitting assignments) or screen pages (e.g. SCORM or HTML, XML base pages). The former is called macro- while the latter one microanalysis.
Through the examination we arrived at the conclusions below.

4.1. Visit statistics of the course

The so-called statistical indexes are efficient supplements to the analysis of learning activities and learning behaviour. Fig. 3 shows daily visits, the number of learners, the learning activity as well as the average length of connection. The way the number of daily visits change reflect a weekly periodicity, that is learners on the correspondence course usually study at the weekend. At the beginning of the course they entered the course fewer times but stayed connected longer, while in the second half of the course turnover was bigger but connection shorter. Site Summary Activity Metrics was used for the analysis, however, results were presented with the help of an Excel programme.
Algorithm may help answer also the question whether enough time was devoted to processing the given object or not (Fig. 4). To answer this question the contents of the particular pages, as well as the average time necessary for their processing, must be known. Both syllabus units of the basics of educational technology, as well as the first syllabus units of digital imaging and image editing consisted mainly of theoretical skills in the form of textual, visual and audio explanations. The rest of the syllabus units primarily processed editing operations with the help of visual and animation elements and audio explanations. Time devoted to processing the theoretical skills does not appear to be sufficient, which is shown by the average results of the check tests (3.26, 2.97).
The Page Usage Metrics stream enables the preparation of statistics segmented according to pages or files. It can for instance be seen over which pages and playing which files (narrative audio, animation, video) learners spent most time. Mediums independent of time head the line with an average of 2 to 6 minutes, while time devoted to visits to screen pages lags far behind with 0.5 to 3 minutes.

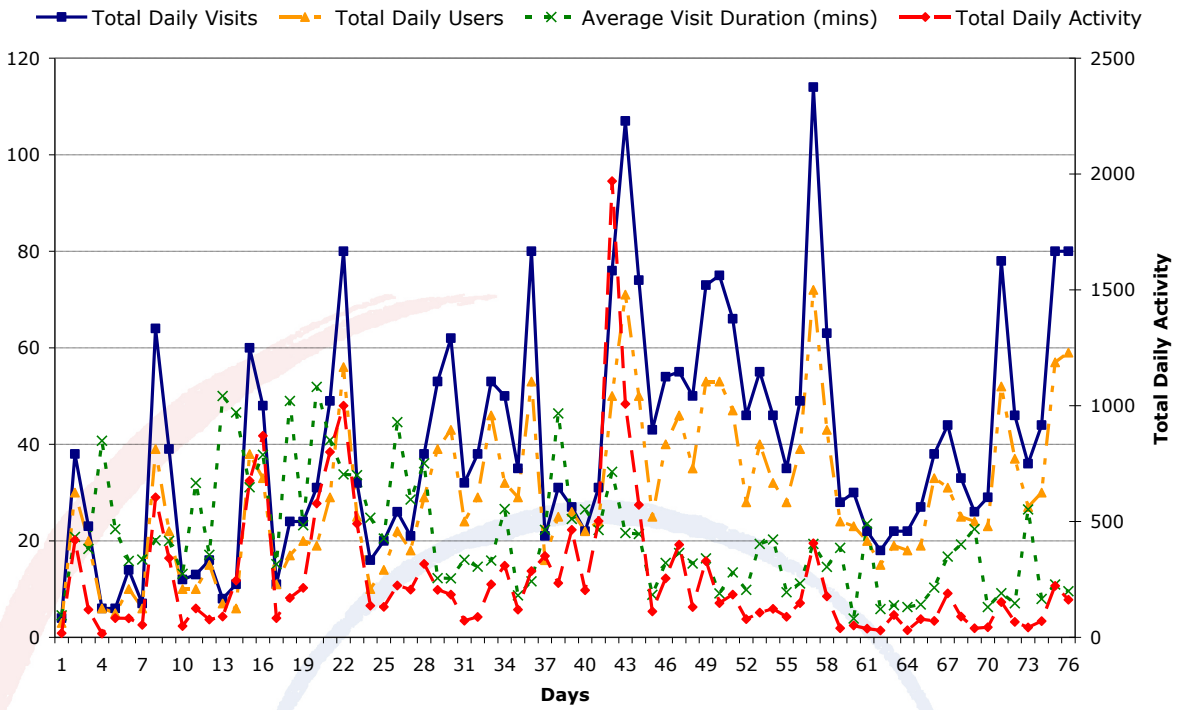

Fig. 3 The learners of the term and visit statistics I

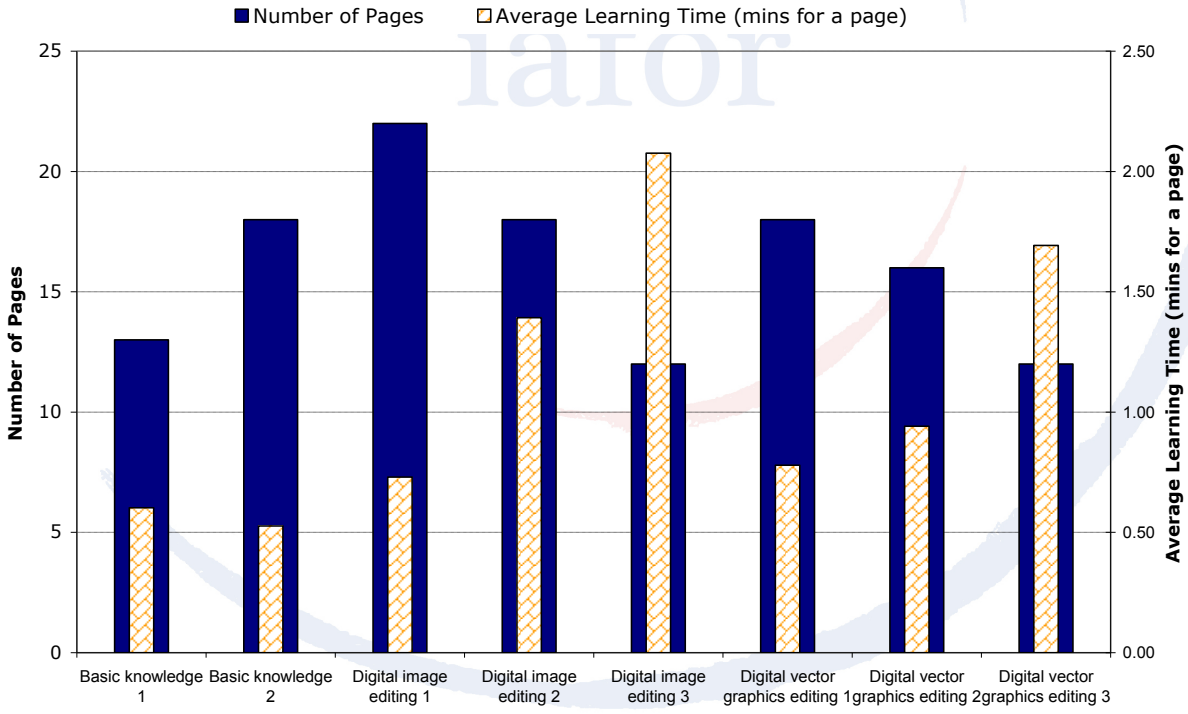

Fig. 4 The learners of the term and visit statistics II

This stream also yields statistics about requests focussing on file types, from which conclusions about learning activities may be drawn, too. In our examined course there were php, html, swf and mp3 files in great numbers. The first one refers to the Moodle objects, html files do so to the interactive syllabus units whereas swf shows the application of Flash animations and mp3 does that of narrative explanations.

4.2. The segmentation of learning activities

An important means of analysing learning activities is segmentation according to event (learning object), visit (sequence of learning events) or visitor (learner). In both cases we wish to create homogeneous groups from the aspects of learning objectives and learning behaviour.
The aim of visit-based segmentation is the identification of the particular patterns and clusters of learning activities, the comprehension of what and why a learner is doing during his activity in the course and finally to aid the developer in recognizing the strengths and weaknesses of the course and in formulating the developmental objectives founded on these.
Based on data characteristics of the use of the Moodle system (time of entry, length and frequency of connection, learning objects used, etc) a learning algorithm groups visits (sequence of learning events) or users (learners in our case). Segmentation takes place in two steps. In the phase of model construction visit segments are created by a so-called two-step clustering, then they are classified by C5.0 algorithm producing decision trees. In the second phase the individual visits are „given scores", then saved in a data file which describes the segments of each visit. The result is the cluster identified, which later may be used for the segmentation of learners, that is the formation of learner groups as well as for certain learning propensity analysis and syllabus-development counselling.
The results of the visit-based segmentation by the Advanced Visit Segmentation stream (focussing on the sequence of learning events) are presented in the isolated clusters:

- *Independent learning directed at the acquisition of basic concepts* which mostly meant the processing of the interactive electronic syllabus of the basics of educational technology, the inspection and extension of the glossary as well as solving the related self-check tests. During their visits to this cluster learners often consulted their teachers with their problems or joined the discussions on the forum. (C1)
- *Learning directed at the acquisition of construction algorithms* which meant the acquisition of the basic operation sequences of editing and imaging programmes by viewing or listening to animations and narrative explanations besides the traditional syllabus contents independent of time. Learners did the self-check tests and practice tasks related to the categories (reproductive knowledge). (C2)
- *Participation at moderated discussions* related to subject categories. The objective of these visits was exclusively the inspection or initiation of comments. (C3)
- The upload to the course of *tasks accounting for the creative application of the material learnt* then the inspection of the assessment. (C4)
- *Checking the acquisition of information,* the inspection of the assessment. (C5)

These clusters may also be interpreted as a significant group of the visits focussing on independent learning, while another one on the „justification" of learning achievement (submitting assignments, tests, comments on forums). According to an other interpretation all but one of the activity groups represent the individual form of learning with the one exception representing a community form of it (C3). A mixed pattern of learning objects was less typical.

4.3. The analysis of the syllabus-processing procedure

Macroanalysis provides great flexibility for the researcher in the identification of event- or object-based learning routes, therefore in the recognition of typical learning habits and strategies.

The interactive syllabus-objects (modules) were divided into smaller, 2 to 3 syllabus units for clarity and achievability, so the particular syllabus units, self-check tests, forums, wikis, etc were classified as independent objects under a given topic (chapter) in Moodle. We were curious to know how learners realized the syllabus-processing procedure as conceived by the designer (syllabus unit 1 – syllabus unit 2 – syllabus unit 3 – self-check test). The Visit Activity Funnels algorithm is suitable for the description of the special patterns of events given in the input data of the stream (learning activity streams) (makroanalysis). During one visit less than 10% of the learners completed a full learning procedure, 35-45% opened the second syllabus unit having completed the first one, and 20-30% processed all the three syllabus units in the course of the same visit. Based on the relation with the particular areas, two kinds of learner behaviour are to be distinguished, namely holistic and atomistic. The *holistic* learner processed all the learning objects belonging to a given area one after the other in the course of the same visit, while the *atomistic* one had visits directed at one or two objects mostly, in other words, his learning consisted of successions of parts of procedures. Fig. 5 presents visits comprised of the syllabus units of the digital imaging chapter and self-check tests in the course of syllabus-processing.

Item	%	Visits	% Starting Activity	Dropout Rate
Digital image editing 1		159	100.00	-
Digital image editing 2		56	35.22	64.78
Digital image editing 3		28	17.61	50.00
Test		13	8.18	53.57

Fig. 5 Learning visits in the area of digital imaging

With respect to forums, wikis and glossaries, two types of behaviour can unambiguously be distinguished, namely *percipient* and *productive*. The former (55-65% of activities of this kind) opens forum comments, follows discussions, leafs through the glossary, while the latter (35-45% of activities of this kind), besides all that, contributes to discussions and makes comments himself. The number of activities of this kind was low, which is primarily due to features of age. A significant number of corresponding students of engineering education belong to „digital nomads" who mainly „consume" information on the Internet but never or rarely take part in the „production" of it. Special tutorial attention is needed to make them active.

Contrary to macroanalysis, microanalysis focuses on the examination of clickstreams. By this the succession of pages (mostly php and html pages) visited by the learner are meant, which is an efficient means of following learner activity and analysing the relation to the structure.

Through the analysis of clickstreams the following questions may be answered.

- Where learners arrived from an where they went on from the screen page under examination. If the developer's expected route differs from the conceived one, the reason for this may be explored through this.

- By analysing an operation stream between two given pages in a syllabus making bifurcations possible the typical processing routes may be mapped, which may contribute to the identification of certain strategies.
- By the representation of page streams between a given minimum and maximum value, related and lasting learning activities are to be identified.

The Visit Page Funnels stream is a means of micro level analysis, looking for clickstream patterns (successive screen pages of syllabus units) defined by the developer among the actual visits realised by the learners. Therefore it proved a suitable means also of comparing syllabus-processing procedures as conceived by the developer and as finally realized by the learners. Three kinds of learner behaviour got identified: testing („tasting"), easily giving up and enduring.

The learner who is *testing („tasting"), orientating himself* only takes a look at the first pages, mostly only leafing through them. Those learners who *easily give up* do in fact study, read the textual contents, listen to the narrative explanation, play the animations and videos, however, they do not even get halfway in the syllabus unit. *Enduring* learners succeed to the end of the syllabus unit, not unfrequently turning a page back and forth and mostly thoroughly surveying everything during the very same visit.

Page	% of Total Visits That Started Activity	Visits	% of Visit Started	Dropoff %
p1		**86**	**100.00**	**-**
p2		**69**	**81.18**	**19.76**
p3		**51**	**60.00**	**26.09**
p4		*45*	*52.94*	*11.76*
p5		*38*	*44.71*	*15.56*
p6		*35*	*41.18*	*7.89*
p7		*34*	*40.00*	*2.86*
p8		*30*	*35.29*	*11.76*
p9		28	32.94	6.67
p10		28	32.94	0.00
p11		27	31.76	3.57
p12		25	29.41	7.41
p13		23	27.06	0.00
p14		23	27.06	0.00
...				

Fig. 6 The three characteristic periods of the learning activity

According to Fig. 6 syllabus unit processing all three types are well identifiable. In the course of „tasting" (p1-3) the learner opens the syllabus, reads the objectives and contents, then turns the pages of the document and finally exits. Learners who easily give up do not even reach halfway of the syllabus unit (p4-8) and 10 to 15% interrupts learning. After that, enduring learners usually succeed to the end of the syllabus. These behaviours were mostly characteristic of theoretical syllabuses. In such a case it

is advisable for the developer to create shorter units and besides contents independent of time integrate time-dependent media, too, into the syllabus and maintain interest.

Summary

Based on the examinations to the open questions posed at the beginning of the research, that is concerning online learning specialities, preferred strategies, as well as the comparison of learning routes as conceived by the developer (expert) and as finally realized by the beginners (learners), the following answers may be given:

1 With respect to the relation to the structure
By the application of frequency-, sequence- and cluster analysis four kinds of typical online learning strategies are to be distinguished on the basis of the relation to the structure, namely the conscious and uncertain followers of the structure, structure-abstractor and the unstructured scanner.
The consciousness and uncertainty of structure following is related to the cognitive stylistic characteristics of the field.
The *structure follower* online learner used learning objects mostly in the order given by the course developer (based on the results of the macroanalysis) and in processing the interactive electronic syllabus he consequently followed the route defined by the developer (based on the results of the microanalysis). He primarily focussed on the acquisition of the syllabus content and not on getting familiar with the structure and the navigation tools.
Tle learner independent of the field manages structure with confidence and has mental models ready to find analogy with ease. However, the structure following of the field-dependent learner is characterized by uncertainty, has no mental models ready therefore spends longer time over the processing of a page. A syllabus allowing of multi-bifurcation fits the former type while that of a linear structure primarily fits the latter most.
The *structure-abstractor* learner opened almost all of the learning objects of the course, took the things to be acquired into account and in processing the electronic syllabus contents tried all navigation and bifurcation possibilities. First he „acquired" the structure and only then did he focus on the information to be acquired.
The *unstructured scanner* learner did not visit the learning objects in the order designed by the course developer, his navigation behaviour is random-like, often proceeded towards contents which seemed more spectacular and usually only concentrated on tasks with a deadline. He visited the course rarely and at uneven intervals. This learner needs a strictly set syllabus structure and permanent tutorial attention.
The orientation of abstractor and scanner learners is largely aided by the placement of positioning elements in the structure.

2 With respect to the timing of learning
The macroanalysis of learning activities may also be performed according to timing (frequency analysis). For this were learning frequency, period and days active introduced. On this basis four types of learning activity were distinguished: frequent – even (dedicated, loyal online learner), frequent – uneven („campaign learning"), occasional – even (average online learner), rare – uneven (superficial online learner).

Comparing the results of the two kinds of examination we got the patterns seen in Fig. 5.

Although to a different extent, a certain learner „dropping off", the giving up of learning due to cognitive or emotional-volitional reasons, is continuously typical of the processing of syllabus units. Regarding the syllabus units (the result of the macroanalysis) it was mostly typical of the ones processed first, while regarding the screen contents (the result of the microanalysis) it was typical of the first few pages. The abortion of syllabus processing was mostly characteristic of unstructured scanners but also to a certain extent to structure abstractor learners. The latter naturally returned later to continue the syllabus acquisition.

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Virtual Resource Rooms: Using Blogs to Share EFL Materials with Teachers and Students

Louise Ohashi

Tokyo Woman's Christian University, Japan

0182

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Abstract

Blogs are well-known for their role as online diaries, allowing millions of people worldwide to share their day-to-day thoughts and pictures. They are also recognized for the commercial opportunities they offer, with popular bloggers monetizing their sites through advertisements and others setting up blogs to promote their businesses. More recently, the educational opportunities blogs offer have been discovered, with educators increasingly willing to incorporate this learning tool into their courses. While many, myself included, use them to facilitate student-to-student interaction, there are other ways that they can be used. This academic year I started two blogging projects, one with my students and the other with my colleagues. In the first project, a blog was used to share worksheets, videos, audio recordings and other materials with my students. The students could freely access the materials but did not have any way to contribute to the site. In the second project, a blog was used to share teaching resources. All of the teachers in my department were given administrative access so in addition to being able to view and download resources, they could contribute their own materials. This article shares the results of questionnaires that were completed at the end of the academic year by the students and teachers who had access to the blogs.
Keywords: *blogs, online resources, resource sharing*

Introduction

This action research project was conducted in a women's university in Tokyo in the 2012-2013 academic year. During that period I taught eight classes that met for ninety minutes a week, with a total of approximately 190 students. In university settings there will invariably be a few students each day who are absent. Those students can have difficulty keeping up if they do not have access to the materials that were used in class and set for homework. Generally, if a student misses a class the teacher has several options. Firstly, teachers can give the materials to a student who will see the absentee before the next lesson. I have used this method and while it works in some situations, I have found it cannot be done in the first few weeks of a course as the students do not know each other well enough to meet between classes and even as the course progresses, there will always be some students that no-one offers to meet. Furthermore, I have had students offer to pass on materials then forget to do so or lose them. Another option teachers have is to put the materials in a designated collection place. For me, this place is a small box attached to my office door. Unfortunately, students seldom need to venture near my office for classes, which may explain why materials are not always picked up. Another drawback is that these methods are generally only useful for paper-based materials. Emailing materials to students can overcome this problem as materials in many different formats can be sent. This is arguably a convenient option for students. However, it can be very time consuming for teachers to write individual emails and add the relevant attachments every time a student is absent. I wanted a better way to deal with this and as there is a lot of evidence to suggest blogs can be useful administrative tools (for example, see Poore, 2013) I decided to create a resource bank for my classes using a blogging platform (Posterous.com).

After setting up the student blog, I shared the link to it with the other teachers in my department and told them they were welcome to use any of the materials. Thinking that others may like to share their materials too, I created another blog on Posterous.com to serve as a central resource bank. Surveys were conducted with teachers and students at the end of the academic year to ascertain the usefulness of the blogs. The main goals were to determine whether the blogs were beneficial enough to warrant maintaining and developing them, and if so, to gather feedback to improve the blogs. This article shares the results of the surveys and discusses them in relation to the overall aims of the blogs.

Literature Review

This article mainly aims to report on the key findings of a small action research project, focusing more on the project itself than the existing literature. However, several points in the literature warrant attention so will be briefly discussed. Firstly, the project was partly inspired by the changes technology has brought to the way schools and classrooms are viewed. The widening conceptualization of classrooms from a purely physical space to one that extends into virtual spaces has led to "a greater focus on the design and use of flexible learning spaces, more use of blended learning approaches and more personalised individualised learning opportunities for students" (Wilson and Randall, 2012). As I only meet students for 90 minutes a week and less often when they are absent, their time in the physical classroom is very limited. However, by putting the materials that I use in class or set as homework

online, and adding materials for extra study, I can give students the chance to extend their learning in a virtual classroom. Furthermore, as convincingly argued by Cope, Kalantzis and the New London Group (2000) in their work on multiliteracies pedagogy, we are living in a technology-driven age that demands a broader range of literacy skills than ever before. They emphasize the need for literacy skills in six modes of meaning: linguistic, visual, audio, gestural, spatial and multimodal. Sharing materials electronically allows teachers to introduce materials in a wider range of modes. In addition to helping students develop skills within their specific area of study, offering a diverse range of modes also give them the opportunity to develop skills (such as computer skills) that will help them in other contexts.

The site for teachers was created to allow staff to share materials that would traditionally be shared in a staffroom. It is becoming increasingly rare for university teachers in Japan to have the opportunity to meet and exchange teaching ideas and resources in their workplaces. This is particularly true if teachers are working part-time, with no office hours. According to the most recent figures from the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT), in 2005 there were 324,083 university teachers in Japan, and slightly more than 50% of them (162,393) were employed on a part-time basis (MEXT, 2006). In my department 65% of teachers work part-time, with most only ever having contact with other teachers who work on the same day. Even full-time teachers like myself may find that they have few opportunities to talk to other teachers due to their different schedules. This severely reduces the opportunity for teachers to share resources in person, so a virtual resource room can provide a useful alternative.

Project Aims

As mentioned above, the main reasons the two websites were created was to make it easier to share information with students in my classes and to provide a platform for teachers in my department to share resources. The websites were introduced partway through the first semester. At the end of the academic year, questionnaires were administered to the students in my writing classes and the teachers in my department. The main goal of the questionnaires was to find out: a) whether students accessed the class website and used materials only when required or more often; b) aspects of the site that students did and did not like; c) the extent to which teachers used their website; d) reasons teachers did and did not use the site; and, e) the type of materials students and teachers would like to have added. This feedback was collected to help me decide whether to continue using blogs to share materials in the next academic year and, if the results suggested that the sites were worthwhile, to give me some ways to improve the sites.

The Blogs

The student and teacher blogs, which were both password protected, were set up on Posterous.com. Although they were on the same blogging platform, they were quite different in style and function. The student blog had a static page that briefly introduced the site with a list of course names at the top. Clicking on these took students to course-specific pages. Each course page had lists of resources that were grouped under sub-headings. For example, one of the classes had the sub-heading “Information for All Essays” for the following list of materials: Basic Essay Structure

Outline, Essay Correction Codes, Draft Checklists, Transition Signals Chart and Essay Report. I wanted to keep the layout simple so used hyperlinks that students could click on rather than posting the files directly to the blog as full documents. Clicking on hyperlinks within the site took students to materials in a variety of formats, including Word files, pdfs, video files, presentation slides and external websites. Non-web-based materials were kept in an online storage system (Dropbox.com) that created urls for the files, so that they could be accessed via the hyperlinks.

The teacher site was much simpler and looked more like a regular blog. Instructions for navigating around the blog and posting materials were on a static page that could be accessed by clicking a link on the blog's main page. Materials could be added either by emailing them to the blog as attachments or uploading them through the blog's posting function. Posterous.com displayed the files in preview form rather than as attachments, so small versions of the files could be seen by scrolling down the blog, and any files of interest could be enlarged and downloaded. The files were all tagged according to course and type. For example, a grade sheet for the first year writing course was tagged as "writing grade sheet" and "Freshman English Seminar". These tags were listed on the side of the blog and could be used quickly navigate to materials in each teacher's area of interest.

Results and Discussion

Part One: The Student Site

The paper-based questionnaire was completed by 57 students from three academic writing classes. Two of those students preferred not to share their results, leaving 55 respondents. The survey asked five questions about the blogs. The first two questions were closed and the other three were open-ended. Question one asked how many times students accessed the blog outside of class and question two asked how many times they used materials from it. These two questions were answered by all students. The three open-ended questions received fewer responses. Question three asked what students did and did not like about the website, question four asked what type of materials they would like to have added to the site and question five asked students to share any other comments about the site they may have. Of the 55 students whose results can be shared, 50 answered question three, 42 answered question four and 32 answered question five.

During the research period, students were required to access the site four times outside of class for homework tasks. In questions one and two, students were asked how many times they accessed the website and used materials from it. Results from question one show that while 47% accessed the site only when required or in some cases less often, the remaining 53% accessed it more often, with 31% of students accessing it seven times or more. With over half of the students accessing it voluntarily, it seems there was interest in the site.

In question two, students were asked how often they *used* materials from the site outside of class. When compared with access, usage dropped considerably, with only 36% of students reporting higher than required usage, and 64% of them only using materials when they needed to, or in some cases even less often. There are two

possible reasons for the discrepancy in access and usage. The first is that students were accessing the site but not finding what they were looking for. This could be true in some cases. However, it seems there may also have been a misunderstanding with the question's aims and the way it was understood because 20% of the students reported using materials once, twice or not at all, yet the homework completion rate was close to 100% for all tasks. This means that some students were using materials from the blog to do the set homework but did not recognize those tasks as *using* materials. In asking about access and usage, I was hoping to find out whether students were accessing the site and finding things they could use to study, or leaving disappointed because they could not find anything useful. I should have asked this more directly.

For question three, which asked what students did and did not like about the site, the feedback was overwhelmingly positive. The majority of comments fit into four broad categories, which will be explored below. Some students made comments about more than one category, so note that the figures refer to the number of comments about each specific category divided by the total number of students.

The two aspects of the site that received the most positive feedback were related to a) the content available and b) how easy it was to find the content within the site. These two areas were each praised by 40% of students. Comments from these areas included the following:

> "There are almost all file in the website so when I was absent from your class, I checked it and got from the file. It was nice for me because I was often absent your class."

> "I like the website because many idea of essay is here. I didn't understand many essay's rules before I watched the website."

> "We can find something we need easily because it is well placed in order."

> "I liked that it is simple. I could find the sheet I wanted to print easily."

Another key area that students mentioned was the usefulness of the site, with 'useful', 'helpful' and similar expressions used by 27% of the students. Some comments were general while others were more specific, as the following two examples show:

> "It is very helpful for me to write my essay."

> "The website helped me to think topics because there were many informations. I'm poor at finding informations of English homepages, so many links helped well. And I liked "Transitions signals chart." It was the best help for me."

10% of students also mentioned the sites accessibility, noting they could "access wherever we are" and "access all the time." As one student wrote, "I like it, because wherever or whenever I think I want to look at materials or data which introduced in the class, I can do that with [the site]."

In terms of negative feedback, there were only two comments. The first one said, "I didn't understand where I can go to get the stuff I needed in the website. I think this website has to be more easy to see." The second one said, "It was troublesome to access the website because I should have typed the URL, so I hope it will be easier to access it." The first comment shows that it is worth checking that all students know how to navigate within the blog and the second one highlights the importance of showing students how to bookmark frequently used websites.

In question four, students were asked about materials that they would like to have added to the site. 23% of students did not respond to this question and a further 20% wrote that nothing more was needed. The suggestions that were listed fit into several categories. The percentages shown are based on the number of comments about each specific category divided by the total number of students. The materials requested were essay and referencing models (16%), lists of recommended sources (11%), details of class content and homework (11%), lists of discourse markers (5%) and writing practice tasks (4%). There were also comments from individual students asking for a way to access the site without needing the URL, general essay tips, Skype and one student even requested a photograph of my daughter. The last two examples are interesting because my aim was to find out how I could use the site to help students with their essay writing and while the first one might have been a request for Skype sessions to discuss essays, the photograph of my daughter has no connection to writing. Perhaps in this depersonalized online environment, that student wanted more personalization. One way this could be addressed is through class photographs.

Question five was only completed by 32 students and the vast majority of responses either repeated information that had been given in other sections or thanked me for the course and the website. Two students added new ideas, with one saying that she had hoped to use the site more in class and the other appreciative of the fact that it covered areas that were not touched upon in the textbook. In terms of praise, there were two particularly encouraging messages that are worth sharing:

> "I was so impressed when I heard about website at first. I thought it was so great for us. Therefore, I appreciate you."

> "It was a first time of seeing this kind of site. It was very useful for writing essays. When I had some problems of writing essays, I always checked the website. Please continue making this kind of website."

Part Two: The Teacher Site

A short questionnaire was also given to the teachers in the department. Question one asked how many times teachers accessed the site, question two asked how many times they used materials from it, question three asked why they did or did not use the site, question four asked about they types of materials they would like to have added and question five asked for general comments on the site.

After the blog was created, an email explaining its purpose and information on how to access and add materials was sent to the teachers in my department. Of the seventeen teachers that were sent that message, eleven agreed to complete the questionnaire.

Question one asked how many times, if any, teachers had accessed the site. Three had not accessed it at all, three had accessed it one or twice, two had accessed it three or four times and three had accessed it seven times or more. It is hard to speculate on the usage of those who did not respond, but the results collected indicate that access by teachers was quite low. Question two showed that five out of the eight teachers that accessed the site used materials from it on at least three separate occasions, with one teacher using materials at least seven times. This was more encouraging as it suggests that if teachers found something useful on the site they returned to look for more materials and became repeat users.

Question three asked why teachers did or did not use the site. Those who used it gave the following reasons: a) to get tests and class worksheets; b) to make use of existing materials that would suit their classes ("no use reinventing the wheel"); c) to get models for making their own worksheets; and d) to align their materials with what others in the programme were using. Those who did not use anything said there were no materials for their subjects or they already had enough of their own materials. One teacher was worried that sharing tests could lead to cheating.

Question four asked for suggestions for new materials. Most of the responses were very general, asking for more materials for the subjects they were teaching, suggesting teachers share ideas or asking for "any type of activity or lesson that actively or more creatively engages the students' language skills." One teacher suggested it "may be useful to have links to sites where we have found good material." The more specific requests were for vocabulary lists, topic-based data files, answer sheets for the tests, sample essays and "ideas about how to use the text in a communicative way." One teacher also asked for a digital copy of the textbook and audio materials. This was unexpected as there were already digital copies so it highlighted the need to share information about materials that are available.

The comments in question five were mainly praise for the site, such as "I think the site is an excellent resource for teachers to be able to share/contribute successful activities and ideas" and "It is a useful site and very user-friendly." There were also two suggestions from teachers. The first one was to simplify the user name and password if possible. The user name and password were related to the name of the university and department. They were similar but not the same for security. Although I prefer to keep them different for that reason, perhaps some teachers prioritize convenience, especially as it is unlikely that the site would be hacked and the information is not highly confidential. The second suggestion was to use folders when the amount of material increased as it may become difficult to sort through. Each file had already been tagged by course name and type of resource. The request could indicate that the teacher who wrote it was not familiar with the concept of categorizing or tagging or did not notice the list. Alternatively, it may suggest that some teachers are more comfortable with folder icons rather than hyperlinks.

Although it was not on the survey, there is one last point about the teacher blog that should be mentioned. While seventeen teachers (excluding myself) had publishing access to the site, only four contributed materials to it. I was the main contributor, making fourteen of the twenty-one contributions. The other seven contributions were made by four teachers. One of those teachers posted directly, but the other three sent their materials to me to post. One tried to post directly before forwarding the file to

me but the other two sent their files to me from the start. Two of the four teachers only sent me the files after I told them how useful a printed version they gave me was and asked for their permission to add digital copies to the site. I did not set up the site just to share my materials and push teachers to share theirs, but to a certain extent this is what happened. This made me worry that I dominated the site.

Conclusion

One of the main goals of this project was to determine whether it was worth continuing using the student blog and acting as administrator for that teacher blog in the next academic year, and the results have encouraged me to do so. The feedback from students showed that many of them found the materials were useful and the blog itself was easy to use. The merits clearly make it worth continuing to use the student blog to share materials with students. The results from the teachers were less encouraging, with fewer using it than expected. Nonetheless, there were some people who benefitted from it and in time, this could develop into something that more teachers find useful. As one teacher said, "I like the idea of having a site, but as with most resource sites, it takes time to build up a base so that the resources are useful." Hopefully the site will grow in the year ahead. The other main goal of this research was to find some ways to improve the sites. Both the students and the teachers gave me some ideas on how to do this. The challenge ahead is to use those ideas to make virtual resource rooms that are even more useful to my students and colleagues.

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A Model Synthesis of on e-Distance Mentoring System Using Online Social Network Service

Photjanee Sukchaona, Monchai Tiantong

King Mongkut's University of Technology North Bangkok, Thailand

0190

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Abstract

The objective of this research was to synthesize a models of e-Distance Mentoring System using online social network service by focus group discussion from 10 experts, and to evaluate the appropriateness of the synthesized model by 5 experts using questionnaire that aimed to use the synthesized model to apply in different 3 subjects on normal classroom. The research results revealed that the synthesized model consisted of 5 components as follows: 1) Social Network Service, use "facebook" for supporting communications, 2) Matching, for matching with mentee and mentor, 3) Monitoring, for monitoring, following, and presenting tasks between mentee and mentor, 4) Learning Guidance, for guiding, helping, recording about activities, and verifying between mentee and mentor, and 5) Learning Evaluation, for learning evaluation of mentee. The research results on the appropriateness of the synthesized model from the experts showed that in very good level (Mean = 4.67, SD. = 0.44). In conclusion, that can be used the synthesized model to apply into e-Distance Mentoring System properly.

Keywords: *mentoring system, online social network, online social network service*

1. Introduction

Education in the learning sector aims to develop learners' proficiency or encourages their innate potential which could be possibly a life-long pursuit. The learning sector relies on suitable environment, condition and education system to develop qualitative education and the abilities to catch up with educational changes. One of the major focuses at the National Education Act, Section 24 shows that the government should be able to provide open education for both formal and non-formal education to promote life-long learning among the public. One way to achieve this policy successfully is to apply communication technology, telecommunication systems and computer to support education access. (Office of the National Education Commission, 2003)

Since the National Education Act, 1999 B.E. enforcement, there has been re-engineering of national and local education departments including centralizing educational offices under the Ministry of Education, decentralizing education districts, and renovating student-based teaching and learning. The movement has shown that education reform has been going on. The office of Education Council, Minister of Education, has proposed the Second Decade Education Reform (2009-2018 B.E.) that emphasizes on the development of empirical education reform mechanisms. Especially for the learning system, the council has proposed self-study and lifelong learning systems which can encourage learners to seek knowledge, to be able to analyze, synthesize and solve problems effectively moreover, to be moral and to be armed with factors and tools that promote proficient and suitable learning. (Office of the Education Council, 2009)

Social networks are not only the connection of various people over the internet but it is also the connection of different networks and online social networks which are modern ways to make friends and connect with one another. Social network service or SNS has also created online societies where people are able to share and exchange utilities, activities or specific interests to one another. SNS relies on the websites basic system which allows people to communicate. Each website provides different services such as email and web-boards. It allows people to share space and information, or create their own webpage with the site's software application. Howard Rheingold, in his book "Virtual Community", defined the virtual community as the communication and information system of social network sharing utilities, thoughts, works, or specific outcomes of communication on the virtual community unlimited by time, territory or location. (Howard, 1993)

Internet based mentoring is, therefore, a kind of learning materials that connect networks and various information. Because Thai students some times struggle with learning achievement, the revolution of the internet network application with learning in ICT has been widely embraced, the social network mentoring system is now considered an advantageous tool and has become a major communication channel between the mentor and the mentee.

2. Objectives of the research

2.1. To synthesize an e-Distance mentoring system model using online social network service with using group discussion techniques

2.2. To evaluate the appropriateness of the e-Distance mentoring system model using online social network service in relation to the developed model by experts

3. Scope of research

3.1. The synthesis of an e-Distance mentoring system model using online social network service with group discussion techniques derived from 10-expert brain-storming in terms of proposal, discussion and conclusion during the group discussion. (Werasit, 2003)

3.2 Elements of the learning model concept comprised:

3.2.1 Conceptual chart

3.2.2 Details of each element

3.3 Experts' concept evaluation was conducted with appropriateness questionnaires by five experts.

3.4 Experts were divided into two groups: group 1 consisted of ten experts to synthesize the model and group 2 consisted of five experts to evaluate the appropriateness of the synthesized model.

The expert qualifications included graduating in the master's degree, taking an academic position or experiencing in advising the master or doctoral degree graduates in terms of educational tasks or online teaching, and having at least two-year-working experience.

3.5 The research was done in the first semester of the academic year 2011 B.E.

4. Methodology

The research consisted of five stages as the following: 1) studying and synthesizing related literature and previous studies; 2) interviewing experts; 3) synthesizing the e-Distance mentoring system model using online social network service with group discussion techniques; 4) evaluating and verifying the e-Distance mentoring system model using online social network service; and 5) revising, improving and concluding the findings as the following details: (Suchart, 2001)

4.1 The principles, concepts and theories from related literature, texts, journals, local and oversea published researches via the internet were reviewed regarding the difference of individual learning, learning theory, educational inventions, online social network based learning, mentoring system, design and development of research tools and various software, together with the National Education Act and the second decade educational reform.

4.2 In the expert interview, findings from the study review and literature synthesis were applied to determine structured interview questions, along with the advice from advisors, and the interview of five experts. Obtained data was concluded to synthesize the concept of the e-Distance mentoring system model using online social network service and proceeded group discussions later on.

4.3 To synthesize the e-Distance mentoring system model using online social network service, ten experts were invited to the group discussion to generating the e-Distance

mentoring system model using online social network service as the following steps: 1) expert selection; 2) development of research tools in the group discussion; 3) qualitative assessment of questionnaires; and 4) data collection with discussion group techniques.

4.4 To assess and verify the e-Distance mentoring system model online social network service, related documents including the e-Distance mentoring system models questionnaires, conceptual chart of the e-Distance mentoring system model and related documents of assessment and verification were sent to 5 experts to investigate whether the synthesized model was applicable for normal classrooms and discover how much the model can promote learning achievement among learners.

4.5 To revise, improve and conclude the findings, the e-Distance mentoring system model using online social network service based on experts' advice and developed conceptual chart of learning model, along with details of each elements was finally conducted.

5. Summary of research

5.1 The findings from the synthesis of an e-Distance mentoring system model using online social network service.

The findings from group discussions of the e-Distance mentoring system model using online social network service consisted of five elements as below:

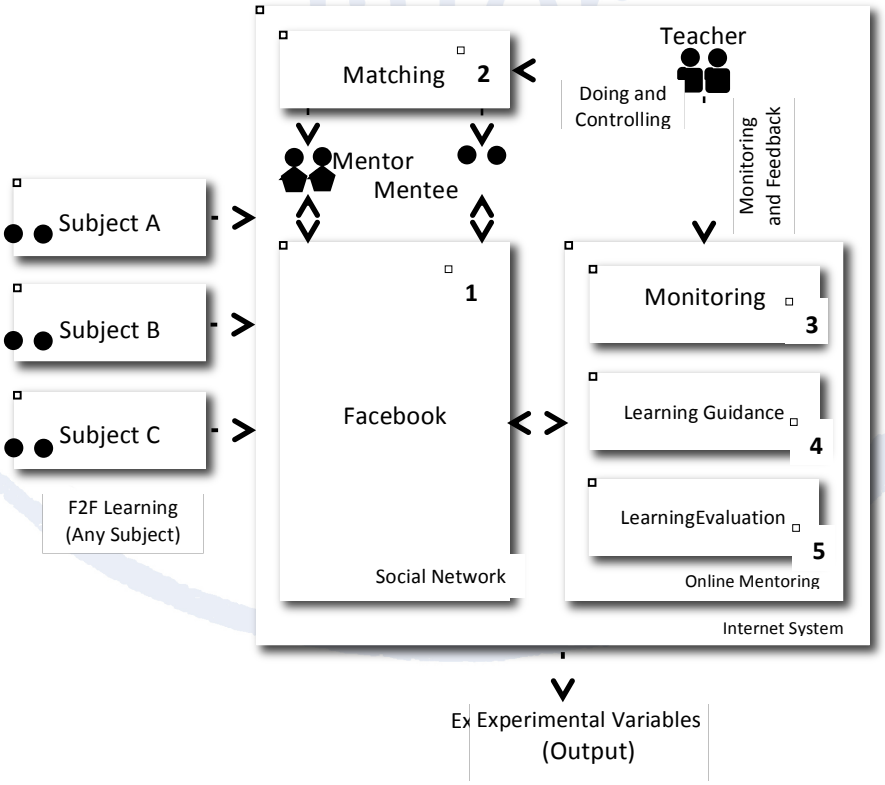

Figure 1: Concept of Model Synthesis

5.1.1 Social Network Service was part of the social network which was the channel of communication between a mentor and a mentee. Facebook was used as

the communication channel between a mentor and a mentee to share their opinions and thoughts.

5.1.2 Matching was controlled and administered by the instructors. It matched a mentor with three mentees. Mentors' qualifications included enrolling in the research subject, studying in the second or the third years, obtaining grade B+ or above, being knowledgeable, and being able to use "facebook" social network application. Mentees were the first year students who enrolled in three different courses and were able to use facebook.

5.1.3 Monitoring was subject to follow up students' learning. The instructor was able to present assignments to the learners, publish news, inform learning data for both individuals and groups, and inform mentors about guideline for cooperative group learning. The instructor was also able to trace login records of individual learners, mentor and record their learning activities.

5.1.4 Learning Guidance was an assistant element to guide learning for both mentees and mentors. It was a guideline to study with the online society according to one's need. It also provided learning sources that coordinated with monitoring.

5.1.5 Learning Evaluation was the element to review and assess learning of mentors and mentees.

5.2 Appropriateness assessment of the e-Distance mentoring system model using online social network service.

Appropriateness assessment of the e-Distance mentoring system model using online social network service by experts as show below in Table 1.

Table 1 Results of the model evaluation in terms of module

Number	Evaluation	$\overline{X}$	S.D.	Meaning
1.	Social network service was appropriate as part of the social network by using facebook as a channel of communication between a mentor and a mentee.	4.80	0.45	highest
2.	Mentor and mentee matching module was appropriate in terms of system control by the instructor .	4.60	0.55	highest
3.	Monitoring was appropriate to follow up learners with supportive channel for learners to access learning activity.	4.40	0.55	high
4.	Learning Guidance was appropriate as a learning support and guidance for a mentor and a mentee to study upon one's need through online social network.	5.00	0.00	highest
5.	Learning Evaluation was appropriate to monitor a mentor and a mentee's learning.	4.60	0.55	highest
6.	The overall of practiced concept.	4.60	0.55	highest
	Total	4.67	0.44	highest

The assessment mean score of the e-Distance mentoring system model using online social network service appropriateness by five experts equaled between 4.40-5.00, the

level of which was high to highest. The overall assessment mean score of the model was at a highest level ($\overline{X}$ = 4.67).

In addition, the experts suggested that the model should be empirically improved and applied in accordance with the National Education Act, 2542 B.E. and the second decade education reform (2552-2561 B.E.) to satisfy different needs of individual learners which was the major aspect of this research.

6. Summary

This study aimed to synthesize an e-Distance mentoring system model using online social network service with group discussions. Data was obtained from literature, textbooks, academic articles and previous studies. Findings indicated that there were five elements of the e-Distance mentoring system: 1) Social Network Service, using facebook as the channel of communication; 2) Matching, the developed system to match a mentor with a mentee; 3) Monitoring, the supportive part to follow up mentors and mentees and let the mentors give assignment to mentees; 4) Learning Guidance, a guiding part to support learning, record learning activities and trace login record; and 5) Learning Evaluation, evaluating learning of mentors and mentees. Then the results were also proposed to five experts for assessment in terms of model appropriateness. Further to their assessment, the appropriateness was at a high level with $\overline{X}$ = 4.67 showing that the model was practical.

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Framework for the Management of Multimedia Tools for Teaching and Learning of Spanish Language

Lidia Ramírez Arriaga*[1], Gek Suan Khor*[1], Boon Yih Mah*[2]

*[1]Universiti Sains Malaysia, Malaysia, *[2]Universiti Teknologi MARA, Malaysia

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Abstract

In the era of rapid development of information and communication technology, both teachers and students are exposed to a great number of multimedia tools which can be used for teaching and learning purposes. Nevertheless, the biggest challenge faced by teachers is how to use the multimedia tools properly and effectively in classrooms. This study is carried out to investigate the proper management of three main multimedia tools, i.e. PowerPoint, video clips and E-Learning, in classroom activities in order to have effective teaching and learning of Spanish language at Engineering Campus of Universiti Sains Malaysia. The set of ideas underlying the basis of the management of PowerPoint, video clips and E-Learning in classrooms is firstly presented. A framework for the management of classroom activities incorporating the combination of PowerPoint, video clips and E-Learning with other resources such as games, songs and additional notes is then proposed. An example of classroom activities implemented based on the proposed framework is also given. The effectiveness of the management framework in order to develop students' language skills in reading, writing, listening and speaking is gauged by means of a survey. Preferences of students on the use of PowerPoint, video clips and E-Learning during Spanish classrooms are analyzed. Outcome of the survey is used as guidelines to further improve the management of the use of these multimedia tools to make teaching of Spanish language more fun, challenging, and interesting to the students.

Key words: *Multimedia tools, management framework, teaching and learning of Spanish*

INTRODUCTION

In the recent decades, teachers have the opportunity to create and use a variety of teaching material using multimedia tools in order to motivate students for learning languages and develop their language skills in listening, reading, speaking and writing. In other words, the use of multimedia tools in teaching and learning have been considerably increased. With the method where multimedia tools are used, teachers can display suitable images, words, voices, video clips, E-Learning materials etc. in an equipped classroom. In this way, students are able to understand the meaning of new words without any translation and memorization.
Researchers have examined how helpful PowerPoint is and how students prefer PowerPoint presentation (West, 1997; Cassady, 1998; Perry & Perry, 1998). In the study conducted by Szabo and Hastings(2000), over 90% of students said that PowerPoint is more attention capturing than the traditional method of lecturing; and 85% found PowerPoint lectures are more interesting than traditional lectures. Nevertheless, many courses that adopted multimedia presentation have not shown a corresponding increase in students' performance (Stoloff, 1995; Susskind & Gurien, 1999). Jones(2003) has highlighted the danger of making PowerPoint presentations available to students. Such practice is said to encourage "students to sit passively through the session since they may perceive they have 'got the notes' ". A major pedagogical issue with PowerPoint presentations is that receivers are "passively engaged" rather than "actively engaged"(Craig and Amernic, 2006). Even though interactive video can help entice learners to pay full attention to learn the material through active interaction between learners and instructional video (Agius, 1999), other studies have reported that there is a little impact of video on learning outcome (Mbarika et al, 2000). Other research study has shown that E-Learning contributes to the enrichment of methodology in the foreign language teaching leading to higher motivation for, and interest of, foreign language learning (Klímová, 2012). Students can learn at their own pace whenever and wherever they are. Nevertheless, teachers face some disadvantage during the process of teaching and learning of language using E-Learning. Face-to-face interaction between a teacher and students is necessary in order to develop the four different language skills. Students cannot develop successfully all the skills with the use of E-Learning only. The efforts by teachers to improve the educational quality of teaching and learning by applying technology give opportunity for distance learning and thus extends further possibilities of learning(Klímová, 2005).

From the findings of previous research studies, it is evident that multimedia tools must be used in a correct way in order to achieve desired results of developing students' language skills and interests. Specifically, it is believed that proper attention should be paid to the management of the multimedia tools in class. With proper management, not only passive and boring classes can be avoided, students' interest in foreign language learning can be improved through their active involvement in class.

OBJECTIVE OF THE STUDY

In this study, a conceptual framework for the management of the classroom activities using PowerPoint, video clips and E-Learning in combination with other resources is

proposed. This management framework is designed to allow students to acquire knowledge of the language gradually and develop the four language skills. With this study, more data about how the multimedia tools can help to promote interactive classes could also be known.

In the following section, methodology adopted in this study is first described. This is then followed by examples incorporating the proposed management framework. Feedback gathered from the students for judging the effectiveness and suitability of the proposed framework is discussed before coming to a conclusion.

METHODOLOGY

This study is carried out to investigate the proper management of three common multimedia tools such as PowerPoint, video clips and E-Learning for the purpose of effective teaching and learning of Spanish language in order to improve student's ability in communication.

As a result of the evolution of education from the conventional teacher-centred to the constructivist student-centred together with the development of information and communication technology, the biggest challenge faced by teachers is how to use the multimedia tools properly and effectively in classrooms. For that reason, the following set of questions and answers have been used to formulate the general idea of management of multimedia tools such as PowerPoint, video clips and E-Learning in the classroom in order to have excellence in teaching.

	QUESTIONS	ANSWERS
1.	What changes would you like to see about Spanish teaching and learning using multimedia tools?	- INTERACTIVE TEACHING AND LEARNING - STUDENTS' SELF-LEARNING
2.	What improvement do you wish the students to achieve using multimedia tools?	- TO IMPROVE KNOWLEDGE AND DEVELOP SKILLS
3.	What are the biggest challenges faced by teachers using multimedia tools in classrooms?	- TO AVOID PASSIVE CLASSES - TO ENCOURAGE INTERACTIVE TEACHING - TO ENCOURAGE AND ENGAGE CRITICAL THINKING
4.	How do teachers make sure that students' attentions are captured in most of the time with the use of multimedia tools and to avoid passive classes?	- WITH GOOD PLANNING, TEACHERS ENCOURAGE AND ENGAGE STUDENT'S ACTIVE LEARNING AND DEVELOP STUDENTS' INTEREST

The answers to the above questions have been adopted in formulating the main ideas underlying the appropriate management framework on the use of PowerPoint, video clips and E-Learning in Spanish class as shown in Fig.1. Details about the main ideas are described in Table 1. These main ideas serve as guidance for achieving success in the classrooms with appropriate management of multimedia tools.

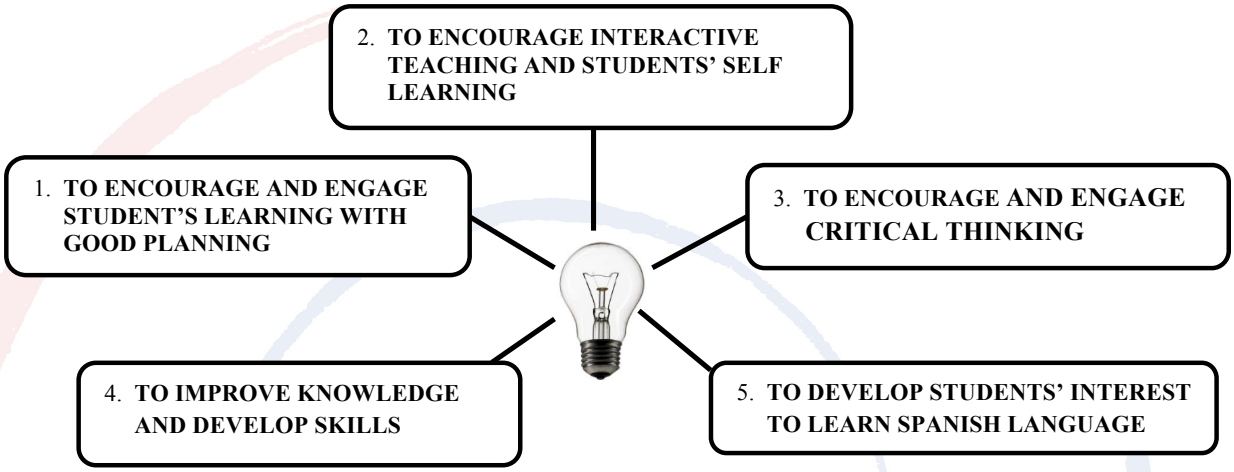


Figure 1. Main ideas for an appropriate management of PowerPoint, video clips and E-Learning in classrooms

Table 1: Underlying details of the main ideas of appropriate management of PowerPoint, video clips and E-Learning

1. TO ENCOURAGE AND ENGAGE STUDENT'S LEARNING WITH GOOD PLANNING
a. Providing clear learning outcomes to give ideas what students should learn. b. Planing and selecting comprehensible materials with an appropriate sequence according to the learning outcomes. c. Planning the time for teaching using PowerPoint, video clips, and E-Learning in the combination with other activities (completing exercises, questions and answers in oral practice, discussions) in order to make the students active.
2. TO ENCOURAGE INTERACTIVE TEACHING AND STUDENTS' SELF-LEARNING
a. Minimizing English explanation with comprehensible slides. b. Screening the slides dynamically and video clips in appropriate duration of time together with other activities, in order to develop active classes. c. Organizing activities which involve students working in groups, individually, or whole class participation with conducive environment.

d. Developing students' command of language with relevant and comprehensible exercises together with enjoyable activities such as playing games, listening to songs, singing, etc. in combination with PowerPoint, video clips and E-Learning. e. Creating an exciting learning environment through watching dialogues in video clips and letting students feel how much they can understand a native speaker, followed by making their own dialogues where students are able to relate and reinforce what they have learned in classroom. f. Providing the exact pronunciation of words, phrases or dialogues with recorded voice in the slides for self-learning. g. Uploading the PowerPoint, Additional Notes and video clips to E-Learning for self-learning.
3. TO ENCOURAGE AND ENGAGE CRITICAL THINKING
a. Creating exercises for students to think and to interact with their classmates. b. During the practice of doing exercises, teacher encourages students to discuss in order to have more interactive lesson.
4. TO IMPROVE KNOWLEDGE AND DEVELOP SKILLS
a. Selecting the linguistic tools that students need to learn in order to develop the basics of the language, such as vocabulary and grammatical structures. b. Creating activities where the students acquire knowledge in a gradual way. c. Creating activities where students order words into phrases, phrases into paragraphs by following the correct grammatical structures. d. Providing diverse exercises using PowerPoint, video clips and E-Learning in accordance with the students' learning styles and language learning aptitude.
5. TO DEVELOP STUDENTS' INTEREST TO LEARN SPANISH LANGUAGE
a. Creating a stimulating environment that will capture the interest of the students. b. Explaining concepts clearly in more than one ways for better understanding. c. Creating exercises that challenge students' ability. d. Selecting suitable video clips according to the students' level of proficiency in order to improve the listening skill and understanding of the expressions used by people in different cultural context.

With excellent management on the use of the three common multimedia tools such as PowerPoint, video clips and E-Learning, students have the opportunity to improve their proficiency in listening, reading, speaking and writing of Spanish Language.

A management framework of PowerPoint, video clips and E-Learning for learning Spanish languages guided by the above ideas has been proposed. E-Learn@USM, the E-Learning Portal of USM, has been used as the tool for E-Learning in this study. Through this management framework, teachers are provided with guidance to manage the use of these three multimedia tools in combination with other teaching resources

as shown in Fig.2. The process of teaching and learning in the classroom using multimedia tools is summarized in Fig 3. Examples of classroom activities designed using the proposed management framework are shown in Table 2.

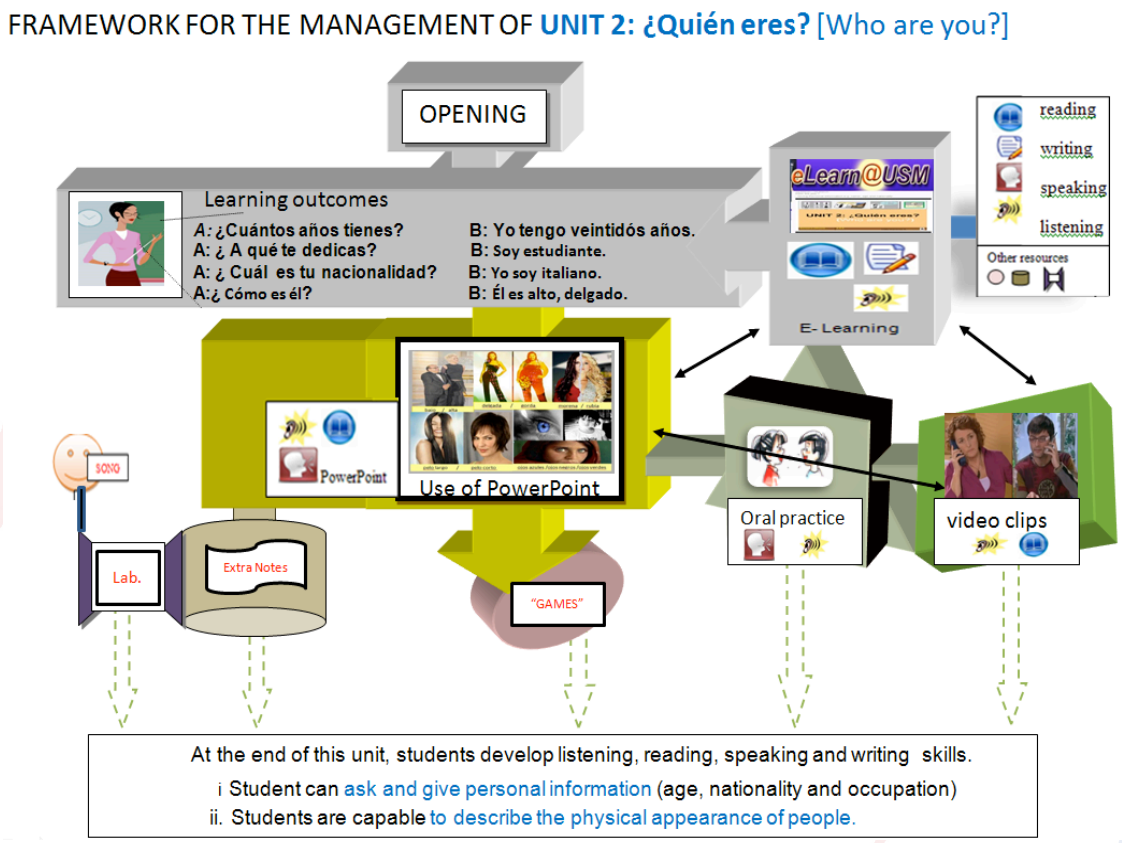


Fig.2: Proposed Management Framework of PowerPoint, video clips and E-Learning

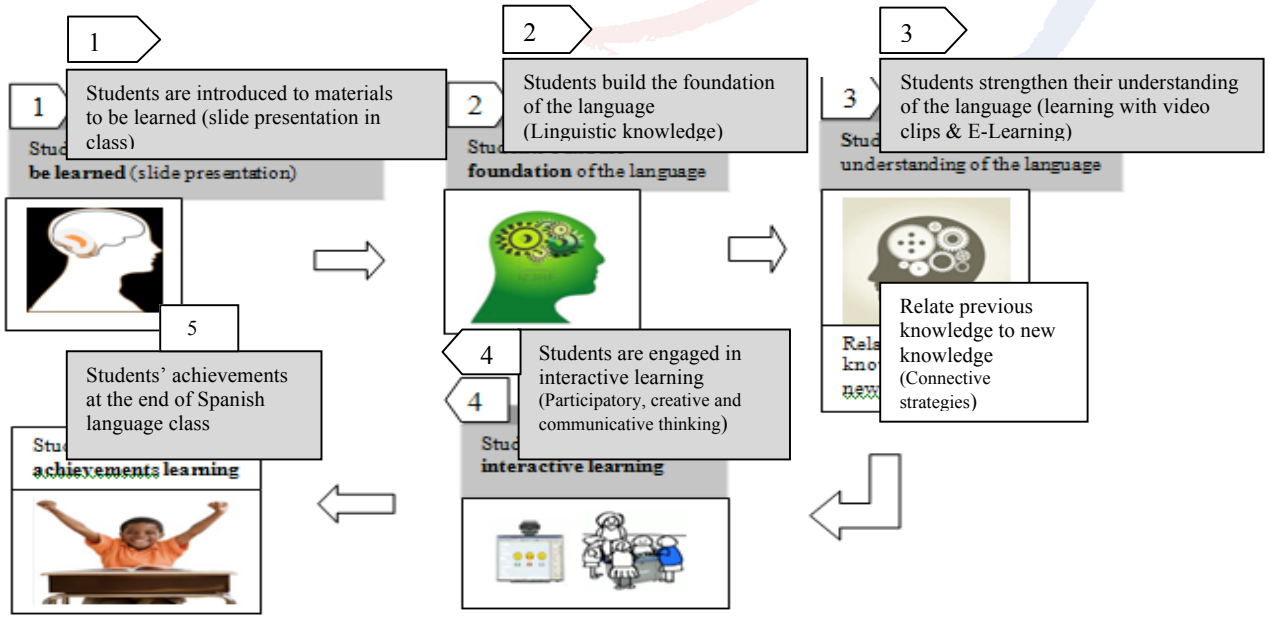


Fig.3: Process of teaching and learning in the classroom using PowerPoint, video clips and E-Learning

Table 2. Example of Spanish classroom activities based on the proposed management framework

UNIT 2: ¿Quién eres? (Who are you?)

Learning outcomes	By the end of this unit, students will be able : To describe a person according to physical appearance and character

Activity 1: Learning how to describe a person according to the physical appearance and character using **POWERPOINT** with sound and **E-LEARNING** web page in combination with other activities.

a) The teacher prepares slides showing people with different physical characteristics and provide the exact pronunciation of the words and phrases with recorded voice in the slides for self-learning.

During the session using **PowerPoint :**

- Students have to relate adjective with images and learn the correct pronunciation.

b) Students have to learn the correspondence between nouns and adjective according to the gender and number

c) Practise in pair:

The students will ask questions about appearance of their family members, using the interrogative pronouns

¿Cómo …..?

¿Cómo es tu padre**?** **Él es alto, delgado, …….**

How does your father look like? He is tall, thin, …..

Activity 2: Learning how to describe the physical appearance of the people using **GAMES**.

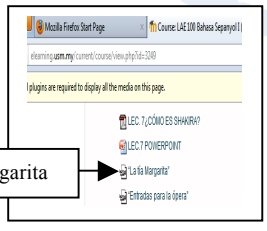
a) Students are required to ask and give information about the physical appearance of somebody.

Students have to ask questions using the verbs **ser** and **tener**:
¿Es rubio**?**
¿Tiene los ojos verdes**?**

b) A student is required to describe the physical appearance of a famous person and another student is required to tell the name of the person based on the description.

Activity 3: Learning how to describe the physical appearance of a member of family using **VIDEO CLIPS** uploaded to **E-LEARNING** web page in combination with other activities.

a) Students have the opportunity to watch and enjoy Spanish language with **video clips** showing scenes very close to the reality.



Students answer the questions and fill in the blanks with suitable adjectives and verbs.

c) Writing exercises:

1. Exercise 1. Haz pareja de contrarios from "Additional Notes LAE100"
2. Fill the boxes using the verbs **ser**, **tener** and **llevar**

Activity 4. Singing a song and identifying adjectives in the lyric using **VIDEO CLIPS** uploaded in **E-LEARNING** webpage
a) Students identify and underline the adjectives in the lyrics of Mexican **song** "EL AVENTURERO". b) Students practice the pronunciation of Spanish words and phrases with the lyrics of **Mexican** song and sing the song.
Activity 5: During the practice of using **POWERPOINT**, all students refer to *Additional Notes* uploaded to **E-LEARNING** web page to ensure the correct understanding of the Spanish grammar.
a) Students are required to associate PowerPoint with *Additional Notes*.

b) Students are required to answer a variety of exercises.
Activity 6: Use **VIDEO CLIPS** produced by the Spanish teacher to improve listening and speaking skills through exercises by answering questions.
a) Students are required to answer a variety of questions and develop their communication skill.

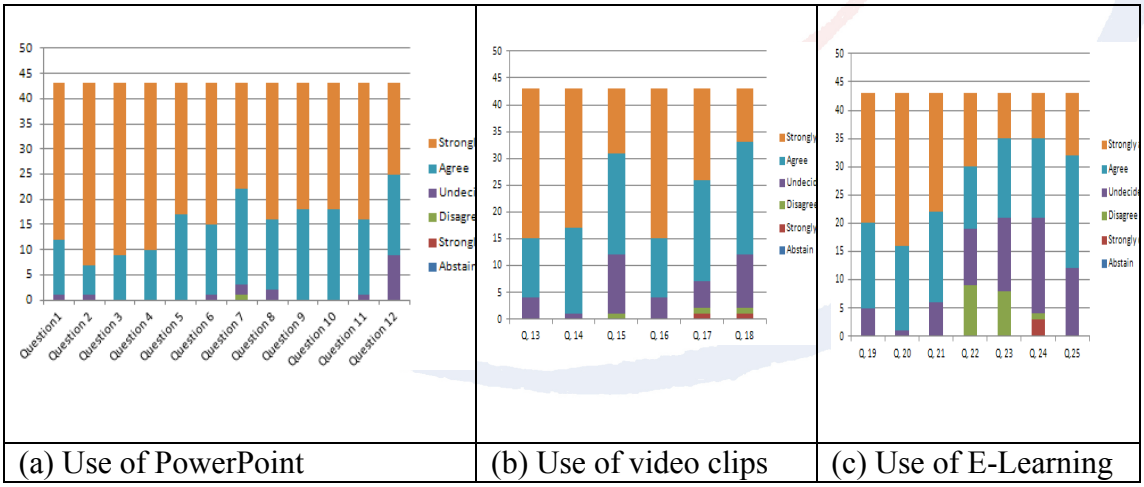
ANALYSIS AND FINDINGS

The effectiveness of the use of PowerPoint, video clips and E-Learning on teaching and learning on Spanish language has been analyzed based on the feedback from engineering students via questionnaire conducted at the end of the Semester I 2011-2012. The response to each question is summarized in Table 3 and Fig.4.

Table 3: List of questions used in the survey for Spanish Language with a total of 43 respondents.

		Abstain	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1.	The teacher uses PowerPoint in all classes.	0	0	0	1	11	31
2.	The teacher combines PowerPoint with other exercises during the lesson.	0	0	0	1	6	36
3.	The teacher combines PowerPoint with other multimedia tools for teaching such as videos, YouTube, video clips, and E-learning.	0	0	0	0	9	34
4.	The PowerPoint presentation prepared by the teacher for the classes help students to understand better about Spanish vocabulary and grammar.	0	0	0	0	10	33
5.	The PowerPoint presentation helps students to remember better.	0	0	0	0	17	26
6.	I enjoy learning vocabulary with my classmates using PowerPoint during the class.	0	0	0	1	14	28
7.	The PowerPoint encourages students to explore and learn the Spanish language on an as-needed and as-desired basis.	0	0	1	2	19	21
8.	The related extra notes with the PowerPoint provided by the teacher promote the interest and understanding of the Spanish language.	0	0	0	2	14	27

9.	The PowerPoint has been designed to minimize misunderstanding of the meaning of the words and to ensure correct undestanding of the language by the students.	0	0	0	0	18	25
10.	To maintain student's interest, the teacher uses the PowerPoint as an interactive material which enables students to plan their own learning.	0	0	0	0	18	25
11.	The PowerPoint materials and extra notes have been planned to nicely complement each other for better understanding of lessons by students.	0	0	0	1	15	27
12.	PowerPoint is the most useful way for me to learn Spanish.	0	0	0	9	16	18
13.	The teacher uses very often videos, video clips, in the classroom and in the language laboratory.	0	0	0	4	11	28
14.	I enjoy video clips because some aspects /scenes very close to reality are shown which help me to understand better Spanish language.	0	0	0	1	16	26
15.	After watching video clips in the class, I am able to speak Spanish more confidently.	0	0	1	11	19	12
16.	The teacher uses very often videos, video clips and songs, in the classroom and in the language laboratory.	0	0	0	4	11	28
17.	I prefer watching video clips, etc. during the class.	0	1	1	5	19	17
18.	Watching video clips is the most useful way for me to learn Spanish.	0	1	1	10	21	10
19.	The teacher uses E-Learning for teaching during the whole semester.	0	0	0	5	15	23
20.	The learning materials in PowerPoint uploaded to E-Learning webpage help students to practise Spanish pronunciation.	0	0	0	1	15	27
21.	E-Learning is useful for self-learning.	0	0	0	6	16	21
22.	I enjoy learning vocabulary alone by myself using E-Learning			9	10	11	13
23.	I prefer watching video clips, etc. after the class through E-Learning.	0	0	8	13	14	8
24.	I prefere to use E-Learning during the class.	0	3	1	17	14	8
25.	E-Learning is the most useful way for me to learn Spanish.	0	0	0	12	20	11



(a) Use of PowerPoint (b) Use of video clips (c) Use of E-Learning

Fig.4: Summary of survey results for Spanish class

The total number of students taking part in this research is 43. Overall, the response of the student was found to be very positive. The framework for the management of Power-Point, video clips and E-learning in the process of learning Spanish language was shown to be effective as positive response (agree and strongly agree) of at least

72% was observed in all questions. From the feedback gathered, the following observations can be made:

i) Teacher used very frequently PowerPoint(97%), video clips(90%), and E-Learning (83%);
ii) 79% of the respondents agreed with question 12: *PowerPoint is the most useful way to learn Spanish* while 72% of the respondents agreed with question 19 and 25: *Watching video clips is the most useful way to learn Spanish* and *E-Learning is the most useful way to learn Spanish,* respectively. Based on their answers, we can assume that students come from the media generation;
iii) Interestingly, students enjoyed learning vocabulary during the class using PowerPoint as well as self-learning using E-Learning as shown in the questions 6 (97%) and question 22 (55%), respectively. The methods for teaching and learning Spanish using multimedia tools are useful for the generation of students surveyed;
iv) Students enjoyed watching video clips during class and after the class through E-Learning; and
v) The education for the generation of students surveyed cannot be separated from the use of multimedia tools.

CONCLUSION

In this study, a framework for management of three common multimedia tools namely PowerPoint, video clips and E-Learning for the purpose of effective teaching and learning of Spanish language has been proposed, implemented and evaluated for its effectiveness in class. Through the employment of this management framework, teachers are provided with guidance to manage the use of these three multimedia tools in combination with other teaching resources. With appropriate management of PowerPoint, video clips and E-Learning, a teacher:

i) Encourage interactive teaching with multimedia tools and students' self-learning;
ii) Encourage students' engagement in the learning process with creative and critical thinking;
iii) Improve student's knowledge growth and develop communicative thinking; and
iv) Develop students' interest to learn language and culture.

The feedback gathered from students at Engineering Campus of USM has shown the preferences of students on the use of PowerPoint, video clips and E-Learning in the process of teaching and learning of Spanish language. It can also be concluded that students have found the use of PowerPoint, video clips and E-Learning in class as an approach which is challenging, fun, interesting, easy to understand, engaging and effective for learning foreign languages and culture. Furthermore, the study shows that the proposed management framework is effective for teaching and learning of foreign languages with the use PowerPoint, video clips and E-Learning, three common multimedia tools.

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Student Directed Twitter Usage in Japanese University EFL Courses

Cathrine-Mette Mork

Tokyo Woman's Christian University, Japan

0194

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When I first started using Twitter for my University EFL classes in Japan several years ago, I would ask students in each class who among them was already using the platform. Typically, one or two people would raise their hands. Most would not even know what Twitter was, possibly due to the English pronunciation I imposed upon this microblogging system, which at that time boasted about a million users in Tokyo alone. In contrast, at the start of my April 2012 classes a couple of years later, to my recollection not one student had not heard of Twitter, and I estimate that at least thirty percent of my hundreds of students in that year already had Twitter accounts. This made it much easier to get started with the platform in 2012. I did not need to offer any technical usage help whatsoever to students. Twitter had become easier to use, my students were more technically savvy, or both.

In a previous paper delving into the pedagogical potential of Twitter (2010), I explained how this system could be used for communicating class content, sending out small, timely pieces of information, encouraging collaboration and feedback, and developing concise writing. Once the user has adapted to the platform and keeps open access to it, Twitter proves to be faster, easier, more social, and more convenient than email as a communication tool for short bytes of information. Twitter can be a great medium for teachers to monitor parts of the learning process, and a fantastic tool through which classmates can connect to and learn from each other outside the classroom. In that paper I also outlined a large array of communicative activities that take advantage of the Twitter platform.

I was highly convinced of the benefits of using Twitter myself for class management from day one of using Twitter, but did not have a lot of time to experiment with the structured Twitter activities I had discovered that might benefit students. By 2012 I was interested in seeing if students, given this tool to play with outside of class with no real structured directives in how they should use it, would enjoy it and perceive it as a benefit to their language learning. With that in mind, for the 2012 academic year I purposefully used Twitter as a form of experimental self-directed language practice in addition to the course management and communication tool I had come to love.

Methodology

I instructed all students in all my classes at Tokyo Woman's Christian University (TWCU) at the beginning of the year that they were to use Twitter regularly, not only as a platform to keep up to date with the coursework and keep in contact with the teacher, but also as an English chatting system, wherein they could casually write to each other about anything they wished, so long as they stayed in English. I told them I would look at their Twitter accounts briefly at the end of each term, checking to see how well they had set up their profile and how much and how often they had tweeted. I told them I was not interested in the quality of their English, just the quantity of their "tweets" (posts or messages). I did not offer a specific number of tweets for which they should aim, as I had no clue at that stage as to what should be considered a "good" amount, and did not want to interfere with students' natural progression in communicating online.

At TWCU, I taught the same students for a full year, even though most of the courses were one-semester classes. This allowed students more time to get used to the platform. Using Survey Monkey, I created a questionnaire of ten questions, which I embedded on my Moodle website, and required that students complete it outside of

class time at the end of the year to get credit in their participation score, which usually accounted for 20% of their course grade. Twitter usage actually overall accounted for about 5% of their course grade, so it did not really affect their overall score a great deal. Due to the nature of the questions I asked, the survey reduced the amount of account checking I had to do at the end of the second term, as students had already answered for me a main question I needed to know to evaluate their work, which was how many times they tweeted.

Below are the questions asked in the survey. Multiple choice answers, sometimes extensive in number, were given for all questions except number 10, from which I hoped to get the most pertinent information for this small study. For many of the questions, students could choose more than one answer if applicable.

1. What course(s) are you using twitter for with Ms. Mork?
2. Please write your full name in English (family name last, please) AND student number:
3. How much did you customize and prepare your twitter account? Check all that apply.
4. Look at your Twitter account. How many times have you "tweeted" since April, 2012?
5. In what section below does your answer to the previous question fall?
6. How many times did you tweet in Japanese?
7. Which best describes your frequency of tweeting?
8. What kinds of topics did you tweet about? Check all that apply.
9. Did you enjoy using Twitter?
10. In what ways to you feel twitter was useful (or NOT useful) to your English studies? Please be thoughtful - take your time and write in English. Don't worry about your grammar or spelling.

Questions two and three from the survey were included to help me grade students, so the survey was not anonymous. I believe this made it less likely that students would provide answers that were inconsistent with the truth, as they hopefully inferred that I would be checking. It also resulted in a fairly decent survey completion rate, although I did think more would have done it.

Results and Analysis

A total of 197 surveys were successfully completed out of a possible 229 students who could have taken the questionnaire. This indicates that 86% of students took the survey, but several students were taking more than one of my classes, so the percentage is slightly inflated. Of the 229 students, there were ten classes. 92 students were in three basic, compulsory freshman communications skills classes (1.2% of these students were also taking the freshman writing course), 19 were in a sophomore presentation class, 42 were in two Career English courses (advanced courses for motivated 3rd and 4th year students), and a total of 76 students were fairly evenly divided into freshman, sophomore, and junior writing classes. The breakdown of users in each class that took the survey varied from 7.1% (freshman writing) to 12.7% (one of the freshman communication skills classes).

Regarding questions addressing how much and how often Twitter was used, at first sight I was disappointed with the results, as they were on the lower end of the

spectrum I had provided in the survey. However, I did go into this project not knowing how much students would and could actually tweet. I predicted that the low figures would be a result of the influence of the large number of compulsory freshman English class takers. Over 43% (86 out of 197) of survey responses came from such students, who I predicted might not be necessarily motivated to improve their skills and may overall also possess lower writing skills, particularly compared with older students in more advanced and specialized classes.

Interestingly, through cross section analyses using the survey software's filters, I found that the survey results were generally not hugely affected (differences less than 2%) by age, level or class subject; very similar graph numbers and patterns emerged for all of the factors assessed through the survey. The overall number of tweets for the whole academic year was less than 30 for almost 60% of all classes, with students confessing to highly irregular tweeting patterns or mostly tweeting only a few times a month. I created a filter on Survey Monkey omitting all first year students, and found that the percentage of those tweeting less than 30 times in the year was actually a little over 60%, so my prediction that compulsory English course takers would use the Twitter platform less frequently was not supported. The only difference was that there seemed to be marginally less infrequent Twitter use patterns in the group containing no first year students. Almost 21% of survey takers reported tweeting between 31% and 60% over the year, and the remaining 20% of students were spread fairly evenly between categories representing between 61 and over 180 tweets.

All students were required to set up their account and profile in detail, but the percentage of students who successfully met all the requirements of this part of their assignment was never more than 28%, except for the request to follow their teacher. 95% of all students who answered the survey did this. Less than 52% changed their Twitter theme, just over 80% changed their profile picture, 41% put in links to other websites they had, 32% followed people outside of class who were of interest to them, and only a little over 60% followed *all* of their other classmates. Students were required not to ever use Japanese on their accounts, and 92% of students obeyed this directive all of the time, and 5% of students only tweeted a handful of times in Japanese.

Students were given a completely free range of topics about which to tweet; they were not even given any topic suggestions. Although I could not predict all of the subject matter that would come up in students' tweets, I tried to create as many categories from which students could select (and they could check as many as applied) in the survey. An overwhelming 94% claimed to talk about what they did, 77% indicated they tweeted about how they felt, and 73% wrote about where they went. I listed these options first, and correctly predicted they would be the most common types of tweets. Over 35% indicated that they used the platform to communicate with other students, about 20% used it to talk about class work, 16% used it to share photos and miscellaneous non-school-related content, and almost 15% used it to interact directly with the teacher. Between 3% and 12% checked the remaining categories: gossip, following celebrities, following friends outside class, and following strangers. Five students wrote uses in the "other" section, but they all turned out to be part of the "what I did" category.

Results of the enjoyment factor were very positive. 77% of all students surveyed reported to having really enjoyed it. Half of this group was already using the platform before it was adopted for class. The other half reported they would continue to use Twitter in the future, although it is not known if their intention is to switch languages. Only 3% reported not having enjoyed the Twitter experience, and almost 17% confessed to liking it "sometimes." Remaining students (less than 7% in each category) either enjoyed it most of the time, or generally enjoyed it, but had no plans to continue tweeting in the future.

The final section of the survey was the most important in that the question directly addressed what students thought about the platform with regard to its usefulness. Reflecting the low percentage of students who did not enjoy using Twitter were a small amount of negative comments (only eight in total), all shown below:

"I don't like twitter. I'm poor to tweet."
"It was hard for me in English." (4X)
"Actually, i do not have habit to check twitter always do it is not useful for me. of course, if i tried to do that but i could not do that. sorry."
"Twitter was not useful for me... because I'm not good at using SNS even Japanese."
"i think it's not useful to study english. but we can enjoy to learn english."

Four more comments were neutral; they did not indicate if Twitter was useful or not. They mostly indicated that they did not use it enough to properly evaluate it. Of all the comments given in the survey, 95% of them contained a positive assessment of Twitter. Eighteen of these comments were not really useful to the study as the students who wrote them did not elaborate why or how they felt the system was useful. The most reflective feedback came from 23 students whose commentary was mixed, as indicated in the unedited examples below:

"I think it is useful that you can study casual English. And also you can follow some artists you like and learn from them without being bored. I don't like solve some English questions to study, but I can continue twitter because it's very simple and I can read even in a train. What I feel it's not useful is that sometimes there is no grammar and it doesn't make sense in the sentences because it's too simple and short. If you want to learn casual English in a long sentence, twitter is not suitable, I think. So twitter is useful, but it can't be a main tool to study English."

"When I was using twitter, I followed some English speaking people, and could know how people use English, more than before. I thought it was not useful, when I found that I didn't know how to explain my feelings, however, that's my weakness in English that I can't say something in this language and it shows that I need to learn more English."

"I enjoy twitter and useful to my English studies! Because,twitter is short sentence.I think it is easy to use, and I became to want to use more English. But,I couldn't use it everyday. Because,I didn't get the havit. And I couldn't follow out of class. Because I wrote personal date. So,I'm afraid. But,I like twitter! I enjoy it! I think to continue using it after the class finished!"

“First of all, it's useful because it gives us the opportunity to write English sentences easily. We don't need to care about our grammer so much. In addition to that, it's useful because we can practice the daily English. However, sometimes it's not useful because we have to write within the limited words.”

“I think it was very useful. I could write anything in English on twitter so it was very helpful to improve my English writing skill. Because talking in Enligh with only Japanese classmates makes feel me doubtful about my English skill. However, I am sure using twitter is very useful to improve English communication and writing skill of students.”

“Twitter is so good communication's tool. Everyone is easy to check and tweet freely, so we can make good communication and increase our vocabulary. But, I am slug or I don't check my twitter frequently so I can't enjoy it so much.”

“I don't think twitter was useful to my Engkush studies because I don't use twitter regularly.” (4X) “But I can communicate with foreign friends in English by twitter, so I'll use it after the course finishes.” (2X)

“I can use English in my life. But I already had have a Twitter account, so it's troublesome for me to change accounts.” (6X)

The remaining comments given by students were 100% positive and I have summarized the students’ reasons below.

I could express my feelings frankly.
I learned/used colloquial expressions, slang, idioms, and abbreviations.
I could easily get to know classmates.
I enjoyed following my friends.
I could easily communicate with the teacher.
I could be reminded of homework easily.
It was fun.
I could easily share pictures and video with classmates.
It was a fast way to communicate.
I did not have to worry so much about grammar and spelling.
It was a good opportunity to use English outside the classroom.
I could tweet with native speakers.
I could follow my idols.
I checked my spelling etc. more often because I didn’t want to look foolish.
I lost my hesitation to write in English.
I could read in English and not get bored.
I could read news in English.

Both the mixed and positive comments above all demonstrate that many students were clear on the advantages and future potential of using and continuing to use Twitter for their English studies. Ideally, I would have likely to have seen students using Twitter more for classwork, taking advantage of many potential language learning opportunities. However, I told myself at the beginning of the year that I would be happy if they simply tweeted in English, about anything. Therefore, even if students did tweet mostly about what they ate, who they ate it with, where they ate it,

how they ate it, and how they felt about what they ate, they were still tweeting in English. Moreover, regardless of the content of their tweets, students reported that they saw the value in it.

Students did not tweet as often as I had hoped. Despite this, the overall results of the survey were extremely encouraging. Can it therefore be assumed that even a small amount of activity on the platform is helpful to their learning? I fear that many students may have been assessing not so much the usefulness of Twitter as a tool to directly improve their language skills, but rather the platform's ability to engage them and help them connect to each other in ways they did or could not in the classroom. Nonetheless, even if this is the case, increased engagement, activity, interaction, and participation as a result of using the Twitter platform in an academic setting has already been empirically proven. A study by Dr. Rey Junco et al. at Lock Haven University says that these increases lead to improved critical thinking, improved phychosocial adjustment (maturity), and better retention of information (2010). The participants in their experimental group of their study actually produced significantly higher grade point averages than the control group.

Implications

Since the results of the survey indicated that using Twitter was both enjoyable and perceived to be of value to students, it is my intention to continue using this platform for self-directed learning outside the classroom as well as a tool for class management. Due to my lack of faith in the results of the investigation, however, mostly due to the lack of volume of activity on the platform, I plan to follow through with another survey for my current 2013 classes at TWCU. I intend to tweak the survey questions and add to them where needed, and more importantly, I will a) give a specific number of tweets students are required to aim for should they desire a high grade, and b) offer and continue to offer suggestions in classes throughout the year for Twitter usage that could potentially affect their language acquisition rate and intensity. I hope the results of a follow-up survey will strengthen the results of the one presented here and offer more credibility to student responses, which I predict will be similar.

This study focused only on students' perceptions and did not aim to empirically assess whether or not any part of their language skills actually improved. A much more ambitious project for the future, emulating that of Professor Junco, would be to design and undertake an investigation that would take a look at just that.

As Twitter has gained popularity over recent years, the number of languages in which it operates has increased to include Japanese, and there has been an ever increasing proliferation of third party Twitter add-on software, making the platform even more accessible and useful to Japanese users. Over the last year I have witnessed obvious increased Twitter awareness, increased smart phone ownership (more than 90% of my students own one), and seemingly more willingness among even luddite learners to embrace this platform (and others). Students in Japan apparently love their mobile devices, so it makes sense that they would be less adverse to putting good pedagogical use to applications and tools with which they are already familiar.

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Volition 2.0: EnglishCentral in the Junior High School Context

Daniel Mills*[1], Olivia Kennedy*[2]

*[1]Ritsumeikan University, Japan, *[2]Omi Kyodaisha Junior High School, Japan

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Abstract

In the past few years, EnglishCentral, a website that uses authentic videos to develop the speaking and listening skills of English language learners, has become a popular tool used by teachers to supplement classroom practice. The following article outlines a research study conducted at a private junior high school in Shiga, Japan that examined the usage patterns of students using the website on a voluntary basis. Data was collected regarding the students' usage of the website in a school computer laboratory and at home. In addition, the participants were interviewed to collect qualitative data regarding the impact of affective factors. The data collected in this study seems to indicate that this use of technology may be beneficial and motivating with students of this age group; yet, expectations must be clearly defined to ensure adequate participation.

1. Introduction:

EnglishCentral is a website that provides students of English as a foreign or second language with access to authentic videos as well as tools to develop students' speaking and listening ability and vocabulary knowledge. Kimura (2010) surveyed student attitudes toward 10 self-study websites and found that EnglishCentral was rated highest among university students in their desire to continue to use the site, their enjoyment in using it, and their perception of its effectiveness. Yet little is known about how younger students perceive and use the site. The following pilot study was conducted at a private junior high school in Japan to gather initial information regarding these factors, and to assess whether EnglishCentral would be a viable medium with which to provide students with listening and speaking practice in this setting.

2. Literature Review:

2.1 English Education in Japan:

English is studied widely in Japan with 98% of the population studying the language for six years or more (Ministry of Education, Culture, Sports and Technology 2011a). Despite recent efforts to make its populace more able to communicate in English (Ministry of Education, Culture, Sports and Technology 2002), the country still ranked 27th of 30 Asian countries in the standardized TOEFL test in 2009 (Educational Testing Service 2010). One possible explanation is that the TOEFL test assesses not only reading comprehension and grammatical knowledge, but also listening and speaking skills. Initially interested in English as a tool with which to gain international economic advantage by utilizing foreign scientific knowledge (McVeigh 2004), the post-war government set up the grammar-translation method of English education (Richards 2001). Now recognizing that English is "an important means to greatly expand opportunities for our children who will live in the global society" (Ministry of Education, Culture, Sports and Technology 2011c), the government is working towards cultivating Japanese people with communicative abilities.

In 2009 the Ministry of Education, Culture, Sports and Technology stipulated that from April 2011 foreign language study would become compulsory from the fifth grade of elementary school. While the language to be studied was not officially designated as English, policies such as the 2002 "Establishment of an Action Plan to Cultivate 'Japanese with English Communicative Abilities'" (Ostheider 2012: 110) led most boards of education to introduce English. This change formalized the intention outlined in the 2008 White Paper of "smooth[ing]" the "transition to foreign language study in lower secondary schools" (Ministry of Education, Culture, Sports and Technology 2008). While only 72 hours of language study were added to the national curriculum, the change means that English is now studied for a minimum of five years during compulsory education. 98% of students continue onto high school (Ministry of Education, Culture, Sports and Technology 2011a), where they must also continue this language study, bringing the total for them to eight years. Many universities also make English a required subject in the first two years of undergraduate study.

It is something of a mystery therefore, that linguistic competence remains so limited. Some have pointed to washback, or the influence of testing on teaching and learning (see Alderson and Wall 1993), as the likely cause. Junior high school students have

just three years in which to master the rudiments of the English language in order to pass the rigorous externally set high school entrance examinations. Since 2002, when the government guidelines stipulated the change towards communicative competence, the English examination has included a listening section, but there remains no speaking test. Students are tested on reading and listening comprehension and grammatical knowledge. The listening section is allocated between 5% and 10% of the total score, depending on which prefecture the student lives in. The writing section of the test requires students to compose a mere two to four sentences or questions. Because of the way that this test is organized, many students and their parents see activities that foster language production rather than comprehension as a waste of valuable study time (Japan: English language tests the nation 2008).

Rivers (2010) suggests that another possible explanation for the lack of communicative competence could stem from the Japanese insistence on native speaker language models. Students see that they cannot achieve the 'correct' pronunciation that the Assistant Language Teacher (ALT), usually from one of Kachru's inner-circle countries (1985), uses, and stop trying. The gap between regular teachers at elementary schools, who have very little training in teaching English and often little proficiency in speaking the language, and these native ALTs, is extreme. Junior and senior high school teachers are generally more competent, but only 27.7% are above STEP grade Pre-1, TOEFL (PBT) score of over 80, or a TOEIC score of over 730 (Ministry of Education, Culture, Sports and Technology 2011d).

2.2 Homework and Volition:

The unstructured and unsupervised nature of this study means that research into computer-based homework is relevant, especially where it relates to motivation and completion. Several trends emerge when we investigate what makes a computer-based homework program likely to succeed. Programs that offer immediate feedback are seen to be of merit (Rüschoff 1986; Sagarra & Zapata 2008; Mendicino et al. 2009). Scaffolding questions or hints are also of benefit (Rüschoff 1986; Mendicino et al. 2009). Rüschoff (1986) also points out that materials must "go beyond the limitations of behaviouristic drill and practice programs" (205) and actually teach, rather than just test, the student.

Another problem is observed by Sagarra and Zapata (2008) and Ayres (2002), and identifies programs with weak connections to the content covered in class time. When these connections are not made apparent to students, Computer Assisted Language Learning (CALL) course components are not regarded favorably. Even Rüschoff, writing as long ago as 1986, advises that teachers regard CALL as "an integrated part of (and an effective way of preparing students for) the other activities of a teaching unit" (205) rather than something separate from it. Peng (2009) finds that if students perceive the homework set to be useful, that they are more motivated to complete it.

2.3 Computer Assisted Language Learning:

CALL_refers to a broad range of research and practice concerning the use of technology to facilitate the teaching and learning of foreign and second languages. Chapelle has stated that CALL provides learners with "individualized interactive instruction unmatched by what can be provided in the classroom" (2008: 6). This is possible because learners have greater control over many aspects of their learning, and can tailor their interaction, in many cases, to their needs (Chapelle 2008). In the

case of EnglishCentral, students can learn using authentic English videos, which they might ordinarily find too difficult, by making use of a variety of scaffolds. Some of these scaffolds include slowing down the speech in a video or the inclusion of English closed captioning. These functions focus students' attention on specific linguistic features, which may be missed without them.

Furthermore, CALL environments can provide Japanese speakers, whose culture often contributes to foreign language anxiety and resulting low willingness to communicate with a safe, and in many cases, anonymous environment in which to interact in the target language. Research conducted by Friermuth and Jarrell (2008) showed that CALL environments were effective in increasing Japanese students' willingness to communicate. In addition, students reported feeling more confident and less anxious during language learning activities that were conducted via computer rather than face-to-face (Freiermuth and Jarrell 2006).

2.4 Technology Adoption:

Japan is known throughout the world for its technology. It is therefore surprising-that Japan has been slow to adopt educational technologies. In recent years, the government has begun to implement sweeping reforms to the educational system, and technology, especially *denshi kokuban* (interactive whiteboards) have been widely purchased. Yet simply providing students and teachers with access to technology is not enough to ensure its adoption and integration. Attitudes and perceptions towards the technology are important yet often ignored factors in the adoption process.

One framework, which can be used to understand the process of technology adoption and the role that attitudes and perceptions play in that process, is the innovation-decision model developed by Everett Rogers (2003). Rogers defines the innovation-decision model as "the process through which an individual (or other decision-making unit) passes from gaining initial knowledge of an innovation, towards forming an attitude toward the innovation, to making a decision to adopt or reject, to implementation of the new idea and the confirmation of this decision" (2003: 163). The model consists of five stages - (1) Knowledge, (2) Persuasion, (3) Decision, (4) Implementation, and (5) Confirmation. The following diagram shows these stages as well as the many factors that affect the process at each stage:

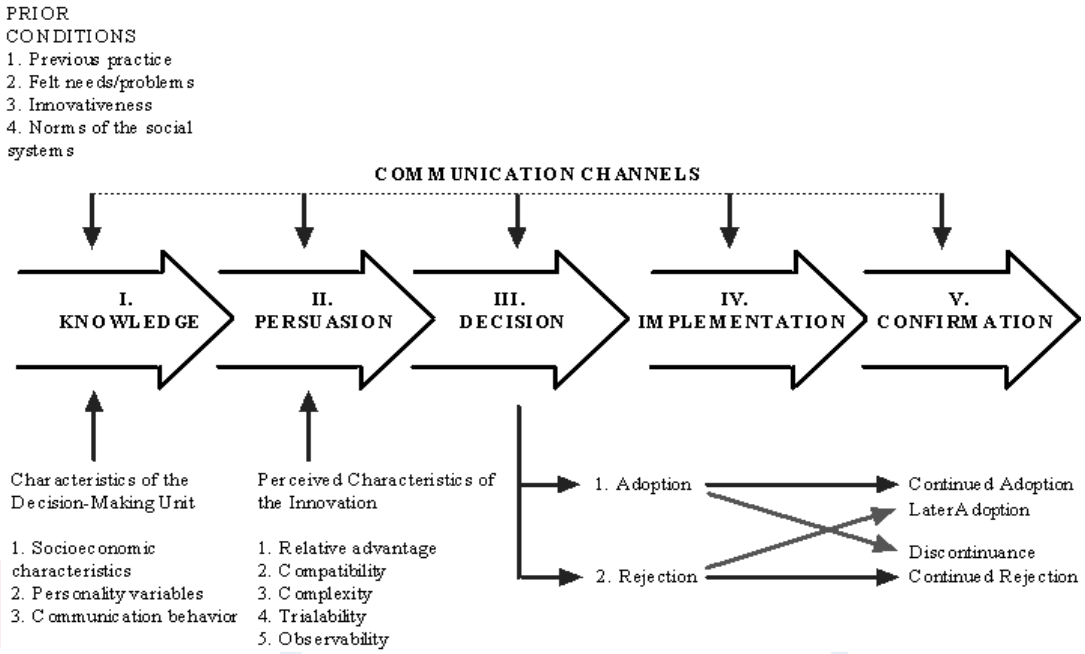

Figure. 1. The Innovation-Decision Model (Rogers 2008)

In the persuasion stage, individuals who have been introduced to an innovation make an adoption decision based on their perceptions of the innovation's characteristics. The characteristics of (1) Relative Advantage, (2) Compatibility, (3) Complexity, (4) Trialability, and (5) Observability have been shown to be predictive of an adoption/rejection decision. Rogers defines these characteristics as follows:

Perceived Characteristics	**Definitions**
Relative advantage	"[T]he degree to which an individual or group perceive that an innovation is better than the object, idea, or practice that preceded it" (Rogers 2003: 15).
Compatibility	"[T]he degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters" (Rogers 2003: 15).
Complexity	**"**[T]he degree to which an innovation is perceived as difficult to understand or use" (Rogers 2003: 16).
Trialability	"[T]he degree to which an innovation may be experimented with on a limited basis" (Rogers 2003: 16).
Observability	"[T]he degree to which the results of an innovation are visible to others" (Rogers 2003: 16).

Table 1. Definitions of perceived characteristics identified by Rogers (2008)

The perceptions of these characteristics are influenced by a number of factors including communication channels, personality variables and the cultural background of the adopter.

Geert Hofstede has identified five dimensions, which can be used to compare national cultures. The dimensions identified in Hofstede's work include (1) Individuality/Collectivism (2) Power Distance, (3) Masculinity/Femininity, (4) Uncertainty Avoidance, and (5) Long-term Orientation. In the adoption of technology, power distance and uncertainty avoidance have been shown to be highly influential (Erumban and Jong 2011). Power Distance is defined as "the extent to which less powerful members of organizations and institutions accept that power is distributed unequally." (Hofstede and Bond 1984: 419). Japan is situated squarely in the middle of the power distance index (PDI) with a score of 54 (Hofstede, Hofstede, and Makinov 2010). This score is common for countries that have been influenced by the Chinese philosophy of Confucianism, which advocates for balanced and reciprocal relationships between seniors and subordinates. In Japan, this is reflected in the respect that students have for their teachers, and is reciprocated through the duty of care that educators demonstrate towards their students. For this reason, teachers and others who are in positions of authority can be highly influential in the innovation-decision process.

Uncertainty avoidance is characterized by feelings of uneasiness and discomfort in unpredictable situations (Hofstede et al. 2010). According to Hofstede et al. (2010) Japan is ranked seventh highest of all nations surveyed on the Uncertainty Avoidance Index (UAI) (2010). Such a high degree of uncertainty avoidance can lead to hesitancy in adopting innovations, or to discontinue the use of technology once an adoption decision has been made.

3. Purpose of the Study:

The overall purpose of this study was to examine the usage of the website EnglishCentral by a group of Japanese junior high school students. Initially conceived as a quantitative research study, the project was modified when it became apparent that few of the group was using the technology. Data was therefore obtained first by monitoring the students' activity through the website's built-in 'Teacher's Dashboard,' then later by interviewing the students individually in their native language.

4. Methodology:

4.1 Setting and Participants:

The 13 students who took part in the initial orientation session were all members of the International Interaction Club, a group that meets afterschool two days a week. The school has many international visitors due to the fame of its founder, and the club's main aim is to make such guests feel welcome. Between 12 and 15 years of age, the almost exclusively female group was keen to attain a level of linguistic competence that would allow them to do this more effectively. The students recognized that the four class hours they spend in class studying English each week, while preparing them for the high school entrance examinations, were doing little for their communicative competence. They therefore asked one of the authors of this article for help. With simply no budget, the authors looked for free software that students could access at home or afterschool that would help to improve their

speaking and listening skills. The computer laboratory was made available for both the designated club times each week. The laboratory has 40 workstations equipped with NEC MY18A/B-3 computers, running Windows XP Professional. The age of the computers, however, made it difficult to use some of the functions of the website, which may have affected the students' uptake.

4.2 Procedures:

Participants were first given a group orientation in their school's computer laboratory. First, the students created Yahoo e-mail accounts, which they then used to register with EnglishCentral. Most of the students did not previously have a personal e-mail address. Once the students registered, they received an e-mail at their Yahoo address and were asked to confirm their registration. Students were then shown how to search for videos in which they had an interest, and how to listen to and 'speak' these videos. Finally, students were taught about the special features of the site, such as the functions that would allow them to slow down the videos and repeat lines, as well as the section that would provide them with vocabulary practice. After the orientation session, students were given access to the computer laboratory two times a week, and usage was monitored through the site's Teacher's Dashboard. In addition, the students were observed during club time, and these observations recorded. Finally, several months after the completion of the study, the researchers gathered the students, and interviewed each in Japanese regarding his or her experiences using EnglishCentral. A professional Japanese interpreter was also present to make sure that the researchers used correct language.

4.3 Data Analysis:

The data that was analyzed in this study originated from three sources: information gathered by the Teacher's Dashboard regarding usage, observations of the students during club time, and interviews of individual students.

Analysis of usage of the website showed, surprisingly, that despite expressing enthusiasm to use the site during their initial exposure, only half of the students accessed EnglishCentral after the orientation session. On average, students watched 16.5 videos, but the range was between 1 and 41 videos. The average number of videos 'spoken', which shows active participation with the learning tool, was 6.7, with a range of 0-17. The following graphs show the number of videos watched by students, as well as the number of videos 'spoken':

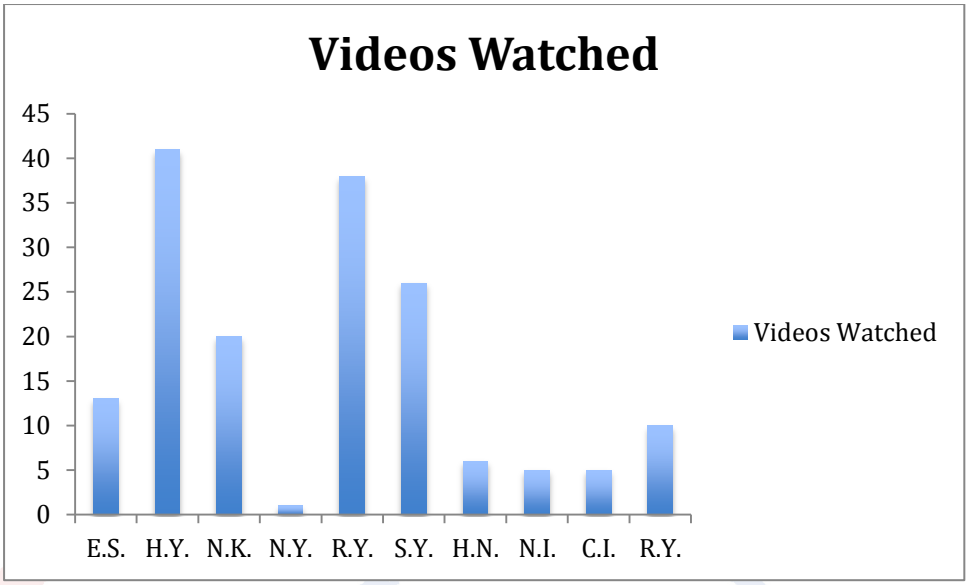

Figure 2. Number of videos watched by students

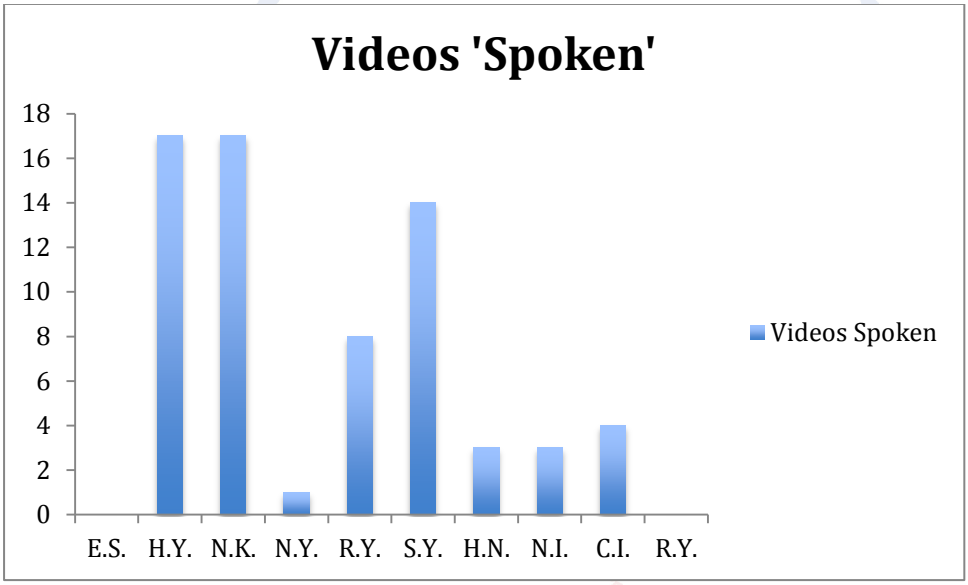

Figure 3. Number of videos 'spoken' by students

Though it is evident that some students made use of the site, especially H.Y. and N.K. who not only passively watched a number of videos, but also chose to actively participate by 'speaking' videos, at least half of the students chose not to do so. The researchers wondered why this was so, and formed two hypotheses. Despite the students' stated motivation to improve their communicative ability in English, another reason for their involvement may have been to spend time with their peers and teachers. As EnglishCentral involves either watching videos then using headphones and a microphone to practice 'speaking' the video or working with vocabulary items, students may have felt that these activities were too solitary. Another possible explanation is how different the EnglishCentral environment is to the standard Japanese language classroom, where activities are traditionally very much teacher-centered. Students may have been simply overwhelmed by the expectation of them to

take an active role in their learning. The reluctance to do so may be explained by the high level of uncertainty avoidance present in Japanese culture (Hofstede et al. 2010). Observation of students during both the orientation and normal club activities provided the researchers with valuable data regarding their needs and desires. In the orientation session, when students were engaged with the EnglishCentral program, the majority of interaction occurred between the computer and the learner. When problems were encountered or if the student had a question, the student would communicate this to the teacher: peer-to-peer interaction was extremely limited. In contrast, during previous computer-based activities during club time, students were seen to be interacting with one another around the technology, when using YouTube to learn the dance moves of a popular Korean hit song, for example. It is important to note, however, that all of the students' conversations about the dance were conducted in Japanese. The only English that was used was when they talked to their teacher, a native English speaker, about the activity in which they were engaged. This behavior seems to reinforce the hypothesis that the students are more interested in interpersonal interaction than in improving their English-linguistic competence. They therefore may not have used EnglishCentral beyond the orientation session due to the fact that the website lends itself to solitary learning activities.

Finally, each of the students was interviewed in order to gain an understanding, in the students' own words, of their experience using EnglishCentral. All interviews were recorded. Common themes were noted, some of which are transcribed here. The first theme that emerged was that the students enjoyed using the site. One student stated:

Q – イングリッシュセントラルを使った経験を何か話してください。使って感じたこと、思ってたこと。
Q – What can you tell me about your experience using EnglishCentral? For example how you felt or thought when you were using it.
A –動画をみました。
A – I watched videos.
Q –他には？
Q – Anything else?
A –他？他は特にないです。
A – Anything else? Nothing in particular.
Q –どんな動画みたか覚えてる？
Q – Do you remember what type of videos you watched?
A –あの～レディーガガ。あとなんか話題の映画とかの、ちょっとの部分みたいな。
A – Well, Lady Gaga. And some kind of little bits of popular movies. (The student may be referring to movie trailers).
Q –楽しかった？
Q – Was it fun?
A –楽しかったです。
A – It was fun.

Yet, students seemed less sure that the site was beneficial to their learning:

Q –それで英語が上達したと思う？
Q - Did your English improve by using it (EnglishCentral)?

A – うん、なんか聞き取りはちょっとだけ。
A – Yeah, it improved my ability to catch what I heard a little.

Another student told us:
*Q–*何かそれをやっていたときの感想。覚えていること。
Q – How did you feel while you were using it (EnglishCentral)? What do you remember?
A– 感想？発音とかがよくわかる
A – My impressions? I understand pronunciation and the like very well.
Q–その、映像とかにでてくる人の発音がよくわかったのか、自分自身のやつ、自分の、C.さんの発音を機械がこう？
Q – Do you mean you could understand the pronunciation of the people who appeared in the videos very well? Or do you mean you now understand how to pronounce words well. Or do you mean that the computer system understood your pronunciation?
A–両方
A – Both. (The student's answer is not clear. She was offered three options.)

Another student did not feel that her pronunciation changed, however:
Q –それ使うことによって自分の発音はきれいになった？
Q – Did EnglishCentral improve your pronunciation?
A–いや、そんなに
A – No, not really.

A second theme was that students seemed to see more benefit in computer-based programs that have a direct connection to either their regular term examinations or standardized tests. One student mentioned EikenCat, a program that had been used with the students during class time to help prepare them for the Eiken test and said that she learnt more from it than from EnglishCentral. She also commented that EnglishCentral was more complicated to use than EikenCat:

英検キャットはシンプルな方で、そっちのセントラルの方はなんかごちゃごちゃした方って感じがした。
I felt EikenCat was simpler, but that EnglishCentral was disorganized and complicated.

Finally, several students indicated that they were not aware that they could have accessed EnglishCentral outside of the school computer laboratory. This indicates a mistake on the part of the researchers who should have communicated this more clearly to the students. The following excerpt from one interview indicates, however, that at least one of the students would not have taken the opportunity to use the site at home anyway:

Q – イングリッシュセントラルを家でも使えるって知ってた？
Q - Did you know you could use it at home?
Q – 知らなかった。
A – No, I didn't.
Q – 家で使ってみたいと思う？

Q – Do you think that you'd like to use it at home?
Q - 使わないと思う。
A – I don't think I'll use it.

5. Discussion and Conclusion:
Discussion 5.1:
This pilot study began with a desire on the part of the researchers to help the students achieve their stated aim of achieving communication competence in English. As such, opportunities were provided for them to improve their listening, speaking and inferential skills, all of which would help them to become more effective communicators. By watching authentic videos in English without Japanese subtitles, the researchers imagined that the students would key into the paralinguistic and extra-linguistic cues inherent in natural communication, as well as improve their ability to catch what was being said and give them confidence in their own pronunciation.

The study rapidly proved problematic. Club attendance dropped, with fewer members coming to the laboratory each session as the semester progressed. When it became clear that the project had stalled, the researchers began to investigate what had happened, and to reflect on mistakes that may have been made. Because the project began as a purely statistical study, we were_initially_hesitant to act so as not to influence the data. We therefore failed to follow up on several issues that may have led to more effective learning outcomes for several of the students.

When it became apparent through monitoring of the Teacher's Dashboard that the students were not accessing the site, we did not immediately gather the students to remind them that they should be using the time when the school computer laboratory had been made available to them to use EnglishCentral. It may have also been beneficial at this time to remind them that they could also use EnglishCentral on their home computers. Upon discussing the project and its limitations with supportive colleagues, it was suggested that better practice may have been to gather the students together for a second follow up orientation session once they had had several opportunities to use the site. This would have allowed the students to express concerns or ask questions, and perhaps solve frustrations that they had been unable to resolve themselves.

EnglishCentral recently published data regarding successful usage of the website. Several of the case studies show that when students are set clear targets for number of videos watched and 'spoken,' and number of vocabulary items learned, student usage of the site increases greatly. The club being a strictly voluntary activity for the students, the researchers were unable to set such targets. Had we used the website as part of the regular curriculum, however, this would have been an excellent way of raising involvement.

Two of the students who took part in the initial orientation session failed to access their newly-created Yahoo e-mail accounts to complete their EnglishCentral registration. They were therefore not included in the usage portion of the data analysis. The two girls continued to come to club sessions, and sat quietly in front of computers displaying the EnglishCentral homepage. The researcher observing them failed to notice, however, that they were using the site as guests, and therefore were neither receiving feedback on their work nor able to access many of the scaffolding

tools. Because each student interacted purely with either the computer or the teacher, neither of these girls noticed that they were experiencing a different version of the site than their logged-in peers. The two stopped coming sooner than other members of the club, perhaps due to this oversight.

One more oversight may have been the timing and execution of the final interviews. As mentioned previously, Japanese junior high school students face an intense examination period towards the end of their third year. It was, therefore, difficult to ask the students to give up study time to be interviewed for this project. For this reason we had to schedule the interviews at a time that would not impact their examination preparation. By the time we did the interviews, therefore, their experiences with the site were not fresh in their minds. Another sympathetic colleague advised us that perhaps it may have been more efficacious to have the website open and allow students to show us how they used the site, and describe their experiences while doing so. This would have facilitated recall, and more students may have therefore been able to give substantial responses to the interview questions.

5.2 Conclusion:

As a pilot study, this unsupported trial of EnglishCentral proved problematic but should not be discounted due to its limitations. The researchers learned valuable lessons about the volition of junior high school students and their needs regarding the use of technology. We believe that if students are given adequate support and clear expectations, EnglishCentral may indeed be a viable option to improve the communicative ability of students in this age group.

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The Development of an Integrated Mobile Learning Model Using Collaborative Problem-Solving Method to Enhance Undergraduate Students' Inquiring Mind

Kotchakorn Saisuwan, Jintavee Khlaisang

Chulalongkorn University, Thailand

0224

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Abstract

This paper is a report on the findings of a study conducted on the development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind. The methodology of this study was R&D research. The subjects were 30 undergraduate students of an experimental group and a control group in Faculty of Education, Chulalongkorn University in the academic year of 2011. The research instruments were the specialist interview form, the inquiring mind test, and the group observation form. The data was statistically analyzed using average scores, standard deviation, and t-test.

The research findings discovered the the development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind consisted of six elements: 1) Infrastructure, ;2) learners, ;3) instructors, ;4) learning collaboration, ;5) supported materials, and 6) communication, while there were five steps in the model : 1) preparation of learners, ;2) identifying the problem, ;3) dividing the learners into small groups and then assigning them to analyze the problem together, ;4) presenting group work and receiving feedback, and 5) evaluation.

Introduction

The Board of Education has set the standard for Higher Education (Thailand Qualifications Framework for Higher Education), which states that the standard of higher education graduates three areas: quality standards of the management of higher education, standards of creating and developing knowledge-based society and social learning. By focusing on all the features nine areas: knowledge, morality is an eager and know how to learn a healthy leadership and sense of volunteerism in public and maintaining Thailand in globalization. The considering the characteristics of the nine areas of Chulalongkorn University. The curious feature have identified features of the undergraduate learning. Graduate students need to seek additional knowledge from different sources. So, there is a lot of research to bring the process of creating the desire for knowledge and learning. The integrated with teaching pattern allow a learner to learn in such a manner that it is learning together. Johnson and Johnson (1986) stated that learning together is the activity which include the exchange of ideas in small groups, not to increase the interest of the participants. That would encourage critical thinking. The exchange of knowledge between the learners an opportunity to cultivate a discussion are responsible for their own learning. Learning strategies of problem solving is a strategy that has been popular and successful in the management of teaching and learning. Faced by the students together. and find solutions to handle the problem on their own (Krulik, S., and Rudnick, JA, 1993), thereby learning a common solution is to bring the subject of further inquiry. In addition to the methods of teaching it. Teaching is also another factor that can be used to enhance learning with curiosity, the current style of teaching that has changed from the original, that is, technology has become an integral part of teaching today. The basic principles of learning that. Learners who seek knowledge on their own to achieve deeper learning. The web-based teaching encourages learners pursuing self. It also encourages the students to have the opportunity to participate in activities with the students and between students and the instructor. Modern technology has stepped into the era of portable electronic devices (Mobile Device) by the portable electronic device with the ability to work even more. Learning mobile-learning (mobile Learning or m-Learning) is an innovation that is likely to be widely used in the 21st century, the researcher is interested to develop a learning collaborative problem solving and learning. The combination of devices to promote learning by a combination of media to develop a process approach to teaching and learning more effective.

The objectives of this study

The purposes of this research were as follows:

1. To study state of mobile learning in order to develop an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind.
2. To improve a design of the development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind.
3. To examine the result of using the development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind.

4. To present design system for the development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind.

Research questions

1. How about the state of mobile learning of undergraduate students at Chulalongkorn university?
2. What steps and elements of the development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind?
3. Can the development of an integrated mobile learning model using collaborative problem-solving method improve undergraduate students' inquiring mind?

Methodology

The development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind was R&D research. The methodology consisted of the following; the researcher

(1) Studied state of mobile learning in order to develop an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind with the questionaires for undergraduate students.

(2) Created the development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind with the nine experts monitoring this model.

(3) Studied the results of using the development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind with 30 undergraduate students, major in educational technology from the Faculty of Education, Chulalongkorn University, academic year 2011. The subjects were similar in terms of age (ranging from 20-21) and educational background. After trial, the researcher revised, modified this model and followed by considering and approving by three experts in the educational field.

(4) Presented the development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind.

Instruments

Instruments used in this research study consisted of the specialist interview form, the inquiring mind test, and the group observation form. The content validity of these instruments was obtained from three experts. These instruments were revised according to suggestion of the experts.

Experiment Stages

1. The subjects completed the pretest of the inquiring mind test to starting the processes of an integrated mobile learning model using collaborative problem-solving method which followed by collaborative problem-solving steps with online learning and studying in the classroom.

2. The subjects performed instructional activities from integrated mobile learning model for 6 weeks (12 hours) as follows:

Step 1 preparation of learners
Step 2 identifying the problem
Step 3 dividing the learners into small groups and then assigning them to analyze the problem together
Step 4 presenting group work and receiving feedback
Step 5 evaluation

Processes	Mobile/F 2F	Instructor activities	Learning activities	Assessment	Inquiring mind
Step 1 Preparation of learners. 1.Recommend students about activities, method assessment and expectance.	F2F	Advise the students about an integrated mobile learning method.	Inform about an integrated mobile learning method.	Inquiring mind test.	
2. Advise how to do activities on Moodle on mobile and install the applications to support the activities.	F2F	Demonstrate how to do activities on Moodle on mobile	Inform how to do activities on Moodle on mobile and install the applications.		
3.Assessment the inquiring mind test	F2F	Give the inquiring mind test for the students.	Pre-test the inquiring mind test.		

Processes	Mobile/F 2F	Instructor activities	Learning activities	Assessment	Inquiring mind
Step 2 **Identifying the problems.** 1.Identified the problems form the topics which follow form contents in the subject.	F2F	Observate the collaboration in group.	Discussion in group.	group observation form	Curiosity, Intention, Initiative, Laboriousness
2.Advice the students about the resources to enhance learning.	Mobile: LMS Moodle / /Social network	Discuss with students each group via social network on mobile, e-mail and advice interested resources.	Discuss in group via social network.		
Step 3 **Dividing the learners into small groups and then assigning them to analyze the problem together.** 1. Students progress in the implementation works.	F2F	Listening to the progress in the implementation works.	Progressing in each group.	group observation form	Initiative, Logic, Self awareness
2. Instructors on hand to help and support more resources to learners.	Mobile: LMS Moodle / /Social network	Recommendation and answer questions of the students.	Helping students to exchange of learning resources.		Curiosity, Intention, Logic

Step 4 **Presenting group work and receiving feedback.** 1. Group presentations .	F2F	Facilitate the presentation and discussion comments.	Presentation and disscussion.		
2. Instructor for opinions on the work of other groups.	Mobile: LMS Moodle / /Social network				
Processes	**Mobile/F2F**	**Instructor activities**	**Learning activities**	**Assessment**	**Inquiring mind**
Step 5 **Evaluation** Conclusion of the activity. Scale and learning features.	F2F			Inquiring mind test	

Data Analysis

After the subjects in the experimental using collaborative problem-solving steps they were graded and received knowledge construction scores by experts. The inquiring mind test was analyzed by using dependent t-test in Table 1. The results of group observation abilities in Table 2 and the results of the analysis of different features of the six areas of inquiring mind in the experimental group between pretest and post-test inquiring mind scores in Table 3.

Table 1: The results of means, standard deviation and an independent t-test result the posttest inquiring mind scores of the experiment group.

	N	$\bar{X}$	S.D.	t	Sig.
Pre-test	30	89.8	20.51	-6.578	.000
Post-test	30	122.13	10.47		

The results showed that the inquiring mind's scores form the before and after experiments were statistical significant at the .05 level.

Table 2: The results of means, standard deviation of group observation form.

Group	Collaboration abilities		Level
	Mean	S.D.	
Group 1	3.6	0.52	Excellence
Group 2	3.6	0.52	Excellence
Group 3	3.7	0.48	Excellence
Group 4	3.8	0.42	Excellence
Group 5	3.7	0.48	Excellence
Group 6	3.6	0.52	Excellence

4.00 – 3.00 = Excellence, 2.99 – 2.00 = Good, 1.99 – 1.00 = Satisfied, 0.99 – 0.00 = fail

The data analysis showed that scores of the six participating groups were very satisfactory. (See Table 2)

Table 3: The results of the analysis of different features of the six areas of inquiring mind in the experimental group between pretest and post-test inquiring mind scores.

Inquiring mind		N	X	S.D.	Different
Curiosity	Pre-test	30	15.07	4.39	5.36
	Post-test	30	20.43	2.37	
Intention	Pre-test	30	15.8	4.54	5.47
	Post-test	30	21.27	2.00	
Initiative	Pre-test	30	13.7	3.48	5.83
	Post-test	30	19.53	2.21	
Laboriousness	Pre-test	30	15.57	3.98	4.9
	Post-test	30	20.47	2.50	
Logic	Pre-test	30	15.37	3.77	4.96
	Post-test	30	20.33	2.20	
Self-awareness	Pre-test	30	14.3	4.07	5.80
	Post-test	30	20.1	2.51	

The data analysis showed that Different features curiosity pretest and post-test of the experimental group on each side. The most difference is initiative and the minor is laboriousness. (See Table 3)

Findings

The results of this study revealed that:

1. The experts' opinions agreed that the the development of an integrated mobile learning model using collaborative problem-solving method to enhance undergraduate students' inquiring mind consisted of six elements: 1) infrastructure, ; 2) learners, ; 3) instructors, ; 4) learning collaboration, ; 5) supported materials, ; and 6) communication, while there were five steps in the model: 1) preparation of learners, ; 2) identifying the problem, 3) dividing the learners into small groups and

then assigning them to analyze the problem together, ; 4) presenting group work and receiving feedback, ; and 5) evaluation.

2. A t-test comparison of posttest and pretest of the experimental group students showed statistically significant difference at.05 level in inquiring mind.

3. The total results of the inquiring mind test showed that the experimental group students were excellence in an initiative.

4. For the test of the group observation form the experiment group students were excellence in collaboration in every groups.

5. The development of an integrated mobile learning model with collaborative problem-solving method to enhance undergraduate students' inquiring mind was presented as follows:

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The Contributions of E-School, a Student Information Management System, to the Data Processes, Environment, Education and Economy of Turkey

Mehmet Durnali

Hacettepe University, Turkey

0233

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Abstract

This paper is about E-school system which has a great importance in increasing the effectiveness of Turkey's Education. E-school is mainly computerized Education Management Information System. It is dynamic, web-based Student Information Management System for centralized Education System of Turkey that provides solutions for schools so as to manage student data. It is developed by using innovative web based software and database technologies to enhance education and used by any kind of formal public or private preschool, primary and secondary schools, inside or outside Turkey, controlled by Ministry of National Education.

Firstly, the article contains a short summary of implementation process, technique, core components, design, and user profiles of E-school. In the main part, it discusses how student information management in Turkey's Education has been handled before and after E-school system. Principally, it emphasizes on how collection, processing, storage, accuracy, analysis and dissemination of student data, organizational policy and productivity, planning, statistic, scalability and transparency in Turkey's National Education sector are improved after implementing E-school. In addition, it focuses on how E-school contributes to teachers, educational authorities, policy makers, students, parents also environment, Education System and Economy of Turkey.

Keywords: *E-school, information communication technology, student information management system, Education Management Information System, Education of Turkey*

INTRODUCTION

... ICT components typically help in (a) supplying computers and connectivity and building school computer labs; (b) enabling instruction in computer programming and computer literacy; (c) (to a lesser extent) developing and disseminating new curricula in electronic format; (d) distance learning (especially as it relates to teacher professional development); and (e) enabling better administration in the education sector (particularly through the development of education management information systems, or EMIS) (Trucano, 2005)

Information and communications technology has been transforming education at different levels. One level where the ICT has been playing a key role for over the last three decades is in the management and allocation of educational resources and providing data on students and teachers often referred to as Education Management Information System (EMIS). According to Tom Cassidy: EMIS is a "system for the collection, integration, processing, maintenance and dissemination of data and information to support decision making, policy-analysis and formulation, planning, monitoring and management at all levels of an education system." (Adam, 2011).

ICTs are being used to help meet education objectives. As many researches prove that ICT use in student information management facilitates collection, processing and spreading endeavor for student data related to education in the ways by enabling data accumulation at a center from schools in distance provinces more efficiently, quickly and inexpensively than using traditional paper-based methods and handling data processing and dissemination by computers easily and accurately. In today's world, existing ICT infrastructures at schools in many countries provides those opportunities and it is also appropriate for Turkey that all primary and secondary schools in Turkey have basic ICT infrastructure to use such ICT components in student information management.

Before 2007, to state and solve problems both locally and nationally by developing fast and accurate, current educational policy through providing transparency MoNE did not have a centralized student based database system in all states of education from all over Turkey. In applying nationally stated policies locally created various undesirable applications. It was not possible to answer the demand of statistics and institutions that have contributions in developing educational policies. There was a lack of technology use in collecting and supervision in student information regarding education. Previously the students' personal characteristics and their academic past were not filed electronically at the center of MoNE therefore it was not available to analyze them easily and accurately. High demands of funds were spent for studies especially gathering and collecting student data in education. All in all, it was hard to consider administrative and functional scalability of Turkey's National Education.

A project team consists of six professionals; ICT Teachers experienced not only in ICT use in education but also software and database development, was charged within organization and worked on meeting the needs of Turkish Education System mentioned above. All of the educational institutions' functions, administrations and circular letters about student data management were considered as a whole and the entire characteristics and needs of them were clearly defined. Carrying out the required analysis and designing the system took one year. By analyzing the present

situation and taking Turkish Education System's benefits into account, the team developed a new student information management software (E-school) to monitor and enhance education in the base of the school, sub-province, province, and national. Primary schools started to use in the second term of 2006-2007 education year and the secondary schools did in the first term of 2008-2009. The maintenance and development of E-school has been continuing with feedback from users and adopting new innovative technologies.

E-SCHOOL

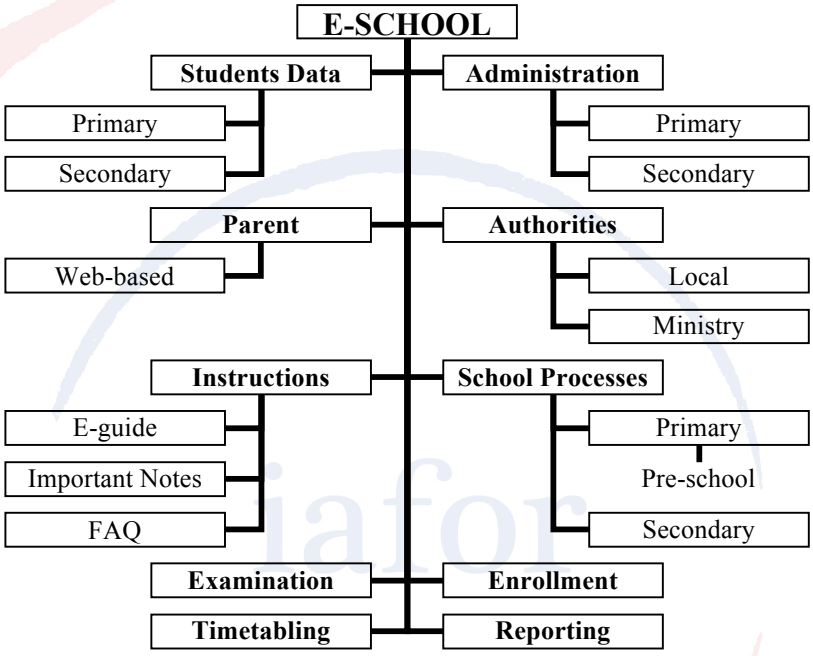

Figure 1. Core components of E-School

E-school is accessible through http://e-okul.meb.gov.tr. It is a dynamic, expanding, thriving, sustainable, computerized, web-based Student Information Management System for Turkey's Centralized Education System that provides denouements for schools in order to cope with student data. It is developed by using innovative web based software and database technologies for enhancing education by providing electronic platform in order to collect, record, analyze, report, disseminate, control, monitor and manage students' data related to education like enrollment, local or centralized exam entries, attendance, grades, transcript, report cards, behavior, assignments, and so forth. E-school consists of nearly 500 web pages and 800 report forms. It is used by any kind of formal public or private preschool, primary and secondary schools, inside or outside Turkey, under MoNE. All the processes on students' data are classified and grouped in E-school according to relevance and transaction of data process. The data that concerns about %75 of the country's total population proves how great system E-school is.

Administrative Module: All affairs, like creating, updating and deleting, regarding E-school users and user groups such as teachers and school administrators are handled through this module.

Ministry/Local Authorities Module: Reports of evaluating success, examination, and children not enrolled, need analysis for new teachers, distributing books and absentees list are handled by Ministry or Local Education Authorities.

School Processes Module: This module contains data like physical conditions of school buildings and instructional methods, students' enrollment, behavior, transfer, absenteeism, grades and diploma.

Students Information Module: It manages student records such as class, certificates, attendance, grade, transcripts, social activities, demographic, health, physical, parents and parents' income.

Enrollment Module: By cooperating with the national address based information system of Ministry of the Interior, the E-school's enrollment module finds out the addresses of students automatically, who are in compulsory education age but not enrolled to school, and enroll them in the school which is near to enrollee's home address.

Examination Module: The instruction manuals about centralized qualifying examinations like Secondary Education Qualifying, and Boarding School and Scholarship Exams related to primary and secondary education students, those application forms, and information about examinations places, examination result are handled through this module.

Reporting Module: There are about 800 different reports concerning all process of students' education such as lists of students not enrolled, student class list, result of Secondary Education Qualifying exam, disabled students, report card, gender equity issues and etc.

Figure 2. A view of E-school

Parent Notification Module: Parents can observe only their own children's information details concerning school life such as attendance, disciplinary, progress overall and schedule.

Timetabling Module: This module can create a high precision weekly timetable automatically.

SYSTEM REQUIREMENTS

The latest advances in web-based technologies used in E-school make it easier to deploy for a new school. There is no need to install a specific program or database to a computer. In addition to user name and password taken from the authorities of E-school administrators, it is enough to have a computer, an Internet Access and web page browser.

TECHNOLOGIES USED

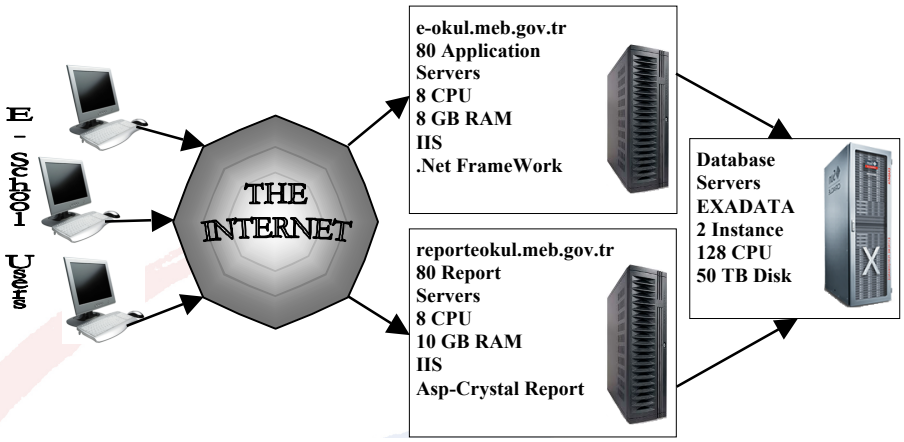

Figure 3. Architecture of E-School

It is developed by using web software technologies like Microsoft ASP .NET, C#, and Java. Reporting platform is Crystal Report. Database Management System is Oracle and PL/SQL is used. There are nearly 80 Web Applications, 80 Report Servers, and 2 Instance database servers that serve for E-school.

USER INTERFACE

It is observed that design of E-school web pages is simple and user-friendly. Color combinations of different panels, object and text on a page do not make users confused. The colors of main parts like toolbar and menu throughout all web pages of E-school is persistent. The main colors used are blue, grey and white. It is seen that a standard menu, toolbar, links, buttons are implemented throughout all web pages and reports of it. That provides users of E-school with easy use of new pages. Text and graphics are legible and highly qualitative. Pictures like students' photo have good quality to identify. In addition, there are also applications for blind users.

USERS

Figure 4. The countries in which E-School is used

E-school system is regularly used by people including nearly 50.000 preschool, primary and secondary education school administrators, 700.000 teachers, 16.000.000 students and 4.000.000 parents, administrators from 81 provinces, 1000 districts and 15 General Directorates. It is the most commonly used website among the other public-institution websites of Turkey. Figure 4 shows the countries in which E-school is used by only schools under Ministry of Turkish National Education.

CONTRIBUTIONS

1. Standardization of Student Information Management Software

Before E-school, each primary and secondary school in Turkey could have its own student information management systems and those systems were different from one another according to their structure and usage. E-school has made it possible that there is now a standard student information management system structure for all primary and secondary education schools of Turkey. The standard results in easy use of the system for school administrators, teachers and parents when they change their school.

2. Data Processes

2.1. Collecting Data: It was so difficult and taking much time to gather information in conventional ways, via paper, post or fax from each school all over Turkey needed for such as making decisions and statistics in education for MoNE. On the other hand, E-school provides opportunity to collect all data from all primary and secondary schools of Turkey in a database by way of web forms in which school staff enter the information required over the Internet. It is obvious that E-school hastens the collecting process of data in the ways making it more easy and short.

2.2. Accessing to Gathered Data: Before E-school, it has some hardships to reach gathered data at schools or at MoNE by getting the data archives physically or requesting through time consuming paper, postal and fax methods. However, E-

school database can be accessed securely by authorized users such as school administrators, education policy makers, statistician, parents and teachers. Its access is easy and fast via World Wide Web over the Internet remotely anywhere without being at data centers and in any time.

2.3. Data Search: In order to search for a specific information in conventional paper-based system, it is so obvious that extensive time, physical and mental effort are required while sorting through lots of documents to find the intended information. With E-school, there is no more a need for that kind of sorting. It is easy to find a specific data such as a student's first exam math grade for the first semester in 2009 in E-school's electronic database archives within seconds with typing a few words or clicking mouse. What is more, in order to control a student's diploma whether fake or not, E-school computerized database archive makes it easier to find that information related to the past.

2.4. Classification of Data: Before E-school, for a paper-based student's information management system at schools in Turkey, labored efforts and much more time were needed so that authorized professionals could change the classification and order of data on papers, or place of data archive. E-school database can be classified, arranged and replaced immediately with sending a few command to computers without extensive efforts and much more time. For example, data could be classified immediately according to criteria like city, district, school, student's name, success, and etc.

2.5. Data Analysis and Statistic: Before E-school, it needed so hard, inefficient and time consuming effort to gather data. After gathering data it was the same for analyzing and explaining the collected data from all primary and secondary schools of Turkey at the centre of MoNE and it is the same for statistic. The tolerance of results could be bigger than expected. E-school overcomes those issues on account of the fact that it has some innovative statistical tools which analyses pure data fast and efficiently. It makes the result reasonable for educational professionals and policy makers by showing the facts on graphs.

2.6. Maintaining Data: Data protecting, modifying, maintaining, updating, expanding, and backing up procedures are required extensive time, physical and cognitive effort for conventional paper-based system. For example, for bulk back-up, every school must find and copy every single paper record one by one. Another example is that every single paper must be found and drawn one more column on it in order to expand data if there is enough space. On the other hand, it is very easy and fast to handle those procedures with E-school. For example, for bulk back-up, it is all about only sending a few commands to computers. In addition, it is easy and fast to change place of E-school's all data archives saved in hard disk. Another example is about expanding data, it is just adding fields to related table of E-school database with sending a few computer command.

2.7. Accuracy of Data: It is a known fact that human beings and so teachers, school administrators and other professionals in education might make mistakes while they perform mathematical or some other operations on any kind of students' data without using any computerized machines. A forgotten number or an addition of one more number can critically change the accuracy of a student's certificate such as diploma. On the other hand, E-school ensures the preciseness of students' data and certificate

such as diploma and report card. All mathematical operations on students' data like additions, subtractions, division and other calculations related to education process of students are carried out by the computers. Furthermore, accuracy of gathered data is expected to be less after gathering information in conventional ways. Over the Internet, each school staff enters the data to the E-school systems via web forms that have some controlling scripts. Now, data from all schools of Turkey gathered by E-school is more complete and valid.

2.8. Legibility of Data: The paper, which is a conventional data storing medium, can become dirtied, faded or damaged, makes the datum difficult to unravel over time. Also, the data written by hand can be impossible or difficult to read with poor or illegible handwriting. E-school as a computerized system eliminates these issues, resulting in a more accurate, clean, legible and organized method of document management over the long term.

2.9. Secured Data: Before E-school, there was more security problems with students' data located at schools with paper format. Precaution for securing that data could be insufficient against flood disaster, fire, terror, and earthquake and stealing. Digital backups of data are made to protect against any loss of data at the centre of MoNE. So there is no more a need to protect data for each school administrators. These backups help E-school to survive and maintain, regardless of any threat including catastrophe to the original data. In addition to Firewall, IPS is used to control data traffic and package. Once a year, it is tested according to penetration and vulnerability. It complies with information security standards of ISO / IECC 27001.

2.10. Space and Equipments for Data Documents: It is favourable contribution that E-school created additional space in whole primary and secondary schools because there is less need to store a large volume of paper records or files of students' data and also furniture or cabinet for those records and files.

3. Automation

Information management of students in educational activities and processes such as enrollment, transfer, scores, examination, attendance, parents notification and also weekly timetable are automated with E-school. That removes many troublesome and time consuming manual bureaucratic processes. Majority processes of performing mathematical calculation on student's data, preparing report card and diploma, keeping the students information, updating and filing, and composing students' files are automated by E-school. For instance, transferring and integrating a student's education documents from old school to new one, such as student file, can be handled electronically in just a few moments over the Internet. In addition to calculations and many other operations on students' data being automated, web-based E-school system allows various reports highlighting anomalies in the education system, such as gender issues, lists of students' not enrolled and disabled students in a city of Turkey, to be generated at the click of a mouse button or typing a few words. For example, E-school helps to create documents such as diplomas and report cards, which once took a school administrator much time to compile, in a matter of seconds. An additional benefit to automating the students' education process is the ability to expediently share information. Information regarding students' education can be independently entered into and taken from the system at the same time by multiple authorized people such as teachers. Lastly, E-school can create a high precision weekly timetable

automatically. It is an advantage to resolve such long time consuming problem while processing weekly timetable manually for school administrator.

4. Enrollment Processes

Before E-school, it was much difficult to identify the school age children that were out the school. Those were the children not only work in industry, agriculture and service sector, but also had some cultural and social oppression especially for female children from rural regions. There could be erroneous transactions through that process because it depended mainly on the school administrators' and teachers' responsibility. It was decided by teachers and school administrators that whether a child needed to be enrolled or not to a school after having controlled child's age, physical and cognitive development. That made the child started to school before or after the school age which caused some negative issues for child like adaptation problem. In addition, some parents forced teachers or school administrator to enroll their children younger than schooll age.

It is automated that the system provides to identify those children. By cooperating with the national address based information system of Ministry of the Interior, the E-school system finds out the addresses of students automatically, who were in compulsory education age but not enrolled to school and enroll them. That solved issue of starting a child to school before or after the school age. In addition, some parents cannot force teachers or school administrator to enroll their children younger than schooll age. It is an advantage that there is no more a need for parents to present such documents, like copies of birth certificate, identity card, residence, telephone, and water invoice to school in order to enroll his or her child. According to a research, it is an advantage of knowing how many students would enroll to school before enrolling process for school administrators in order to make more efficient enrollment process plans. (Sincar & Özbek, 2011)

5. Absenteeism Processes

Non-Attendance Module is developed for children enrolled to school but absent depending on various excuses. By this module, the students under risk of absenteeism can be monitored and determined and so the required precautions for that absenteeism can be taken easly and in time. Furthermore, with the use of the Catch-Up Module for students fall behind the programme, the monitoring of the students is also available and thousands of children were involved to education. Furthermore, it is possible to make advanced analysis on absentees like absentees resulting from economically disadvantaged situation.

6. Examination Processes

Before E-school, centralized qualifying examinations, related to primary and secondary education students, such as Secondary Education Qualifying Exam, Boarding School and Scholarship Exam, and Regional Boarding School Exam, were handled in conventional ways. All procedures including instruction manuals about exams, exam application forms, information about examinations places, and examination result documented on papers at Centre of MoNE and sent to schools and students all over Turkey by post. With E-school, the instruction manuals about all these documented in web based platform electronically. That makes those examination procedures fast and more accurate. That system also automatizes examination payment control procedures. Exam fee is paid to some bank accounts

opened for examinations, this computerized bank account systems and E-school can work together for controlling exam fee whether it is paid or not.

7. Processes of Making Decisions in Education

Before E-school, customary gathering and analyzing methods made decision making processes difficult and longer in order to formulate national education policy, coordinate policies, set standards and to monitor performance in education for MoNE. On the contrary, E-school hastens the processes in the ways data can be accessed without great difficulty. Statistical tools analyse and integrate pure data and make it reasonable for educators and policy makers by bringing growths, trends, risk and relational implications to the known surface. Therefore, it is much more easy and accurate for educational policy makers at the center of MoNE, in order to analyze educational requirements such as building new schools or classroom, employing new teachers, procuring new educational equipment, regarding potential or existing students, and preparing the centralized exam files. With accuracy of data provided by E-school, more healthy and efficient decisions can be taken about Turkey's educational requirements and planning.

8. Parent Notification

Through the system, the opportunity of communicating with parents and notification of education process of 16 million students is provided. Monitoring the student information for parents is much easier with E-school's parent notification module. Parents can supervise the student information like attendance, disciplinary and progress overall record through the module without attending the parents meeting or waiting student's report card. By opening the module to parents, transparency is provided in each step of the procedures concerning the students' school life.

9. Preventing Creating Counterfeit Documents

E-school helps to prevent creating counterfeit school report, diploma**,** certificate of appreciation, certificate of honor, and testimonial documents by given every document a unique security number and preparing those documents based on saved data of the system.

10. Protecting Environment

By this system, all the procedures concerning about 16 million students' education are transferred to electronic media. In detail, before E-school project, each primary and secondary school student in Turkey had a student portfolio including student enrolment, school transfer documents, the correspondences with parents and the files on consultancy. Furthermore, each school administration used to keep 25 enrolment files for students. E-school's enrollment and examination modules made those enrollment and examination procedures not paper based and resulted in less paper usage for those processes. In addition, parent notification module decreases usage of paper letters for informing parents. It is marvelous result that less paper is used in schools for educational processes of students with E-school.

11. Economic

Previously, each student had a student portfolio mentioned above. Annual cost of this file is about 3 TL (approximately $2 USD) for a student. Each school administration used to keep 25 enrolment files for students. By transferring these files related to

almost 16 Million students to electronic media nearly 80 million TL (almost $50 million) is saved annually.
Establishing a student information management automation system costs almost 1000 TL ($625 USD) for each school who could afford. By E-school, which was developed by MoNE's own personnel, schools can benefit from it for free. The school expense of schools on those software disappeared and almost 40 million TL (equaling to $25 million USD) are saved yearly.
Prior to E-school, it would cost almost 9 TL ($6) to inform per parent by post and paper annually but there is no more a need for such an expense by the system. This leads to saving up 135 million ($85 million) annually.
There is no more such expenses like backup, maintenance, and security of students' data for schools. It is obvious that E-school decreased the expense of archiving materials by decreasing the paper and file usage at schools.Making examination procedures electronically decreased the expense of those examination procedures at schools by lessening the paper and post usage.Enrollment module brings about no more a need for copies of birth certificate, identity card, residence, telephone and water invoice so that expense of such photocopy disappeared. Financial allocation is more efficient by assessing resource allocations such as number of books needed by students in education in an accurate manner. Finally, thanks to automated system, gained time by professionals in education while managing student information is priceless.

12. Gaining Time

All advantages as a result of that automation mentioned above results in less remarkable time needed for student information management, which can help to concentrate on the education more for teachers and school administrators. Also parents spend less time for notification.

13. Other Functional Projects Based on E-school's Data

Data of E-school is also used by some other important and functional web-based modules developed for education such as licensing Turkish folk players and musician at schools from all over Turkey, licensing students for any kind of sports, like football, needed for sports organization between school at local and national level, boy scout and students camping, disabled students, module of analyzing needs for new teachers, open primary education and vocational high school. With E-school data, these modules were implemented easily and got better performance for automation.
With the disabled students' module, the real number of those students identified accurately and so the money provided for those students by MoNE was taken under control. Thanks to the module, approximately $5,5 Million USD, which was defrauded by some disabled school owners, is saved monthly. Students that graduated can be monitored by graduates module. With the module of analyzing needs for new teachers all around Turkey, it is possible to distribute teachers more precisely to schools. Finally, those licensing modules help to prevent creating counterfeit license. Student camp application and selection module provides solutions for unjustness in these processes and the money provided for those activities by MoNE was taken under control by knowing the actual number of license and applications.

14. A Model to Other Education System

Taking all advantages of E-school mentioned in this paper into account, sharing experience of E-school is worthy of international recognition. E-school has been introducing at international platforms and it took great interest by concerned educational professionals. A few countries such as Netherlands and Republic of Azerbaijan analyzed the system. Turkey's E-school, the student information management system in education activities, can be a model to other countries' education. Not only does E-school help manage students' information through school life, but it also contributes to country's economy, future of education and innovation in education. E-school is more likely to be implemented in countries whose education systems are centralized.

CONCLUSION

In this paper, it is elucidated what E-school is and how student information management has been handled in Turkey's education before and after E-school. It emphasizes on the contributions of E-school not only to dynamics in education like teachers but also to data processes, environment, Turkey's Education System and economy.

E-school creates change and transforms ICT use in education. The system gives a clear picture of education and provides lasting impact on a significant scale. It provides school and educational administrators, policy makers and teachers with easy management of students' information procedures and those processes function fast and economic by automation which lessens bureaucratic procedures. It is now more accurate to find out the students not registered, the absentee and also to monitor the academic success, physical and cognitive development, behavioral patterns.

The system helps the administrators, teachers and policy makers make accurate, fast analysis and decisions about such as immediate needs and development of education system by enabling them to carry out their task easily, efficiently, and timely manner. As a result, it helps them focus on the educational aspect more, the learning needs of students.

E-school results in a more accurate, clean, legible and organized data over the long term by improving information characteristic of students. This system makes data processes easier by checking the sameness of data items within multiple fields, establishing a mutual relation between them, executing mathematical operation on them, and fetching only the data that matches each single principle. The education statistic is strengthened and reliability is improved by producing more relevant, reliable and timely data.

E-school plays an important role in expediting preparation of academic research, policies development studies, strategic plans and projects by referring emerging organizational issues and providing appropriate, valuable and accurate information. It is easy to consider administrative and functional scalability of Turkey's Education System for district, province, regional and national based.

Making centralized exams and enrollment procedures automated removes many difficulties and time consuming manual bureaucratic processes. By Non-Attendance

and Catch-Up Module, the students under risk of absenteeism can be determined and so the required precautions can be taken easily in time. By saving almost 150 million papers spent for 16 million students, Turkish Education has become a more sustainable eco-friendly system.

Considering all the advantages economically, especially saved time while handling student information, the public expenditure of money on student information management decreased at noteworty. The saving is transferred in improving the quality and development of education.

With all outstanding contributions, E-school can be an example for other countries. Finally, by gathering new generations' whole education and behaviour data at a center, E-school helps make efficient plans and take precautions for the future of the nation.

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Ipads In The University Classroom: Educational Change In The United Arab Emirates

Tamim Rana, Doiron Gilles, Colburn Linda, Attallah Fida, Essary Jessica
Dada Robin

Zayed University, UAE

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Abstract

On the 23rd of September 2012, the UAE Higher Education iPad Initiative was officially launched by His Highness Shaikh Mohammed Bin Rashid Al-Maktoum. This initiative aims to trigger substantive change in the practice of teaching and learning in the three federal tertiary education institutions of the UAE, and is one of a few undertakings worldwide to provide a massive number of students and faculty with cutting edge technology to support the learning process. The investment is enormous and the stakes equally high, and thus there is an increased impetus for educational technologists and academicians to identify best practices and critical success factors associated with the particular UAE context. As such, it is extremely important to research and document the experience as it unfolds in order to create awareness of the lessons learned and advance future efforts. What are the advantages of iPad use in the classroom, challenges facing successful integration, lessons learned and needed resources and support? What do students see as the advantages of iPad use in the classroom/on campus/ at home, and the challenges facing successful use? This paper will present a literature review on mobile learning and describe the research design and methods of an ongoing two-year investigation into the implementation strategy at one of the UAE Higher Education institutions.

Introduction

One cannot ignore the importance of utilizing technological innovations to meet the net-generations' needs in the 21st century classroom. The iPad is one of the latest in a long list of tools that has been introduced to classrooms around the world with the hope of facilitating the shift of technology's role from a delivery-tool to an enabler that enriches the learning experience. Nevertheless, numerous research findings indicate that the mere introduction of technology does not guarantee a successful move to student-centered learning. Instructors need adequate technical skills, positive attitudes, and expertise in implementing appropriate pedagogy in instructional design.

Considering the novelty of iPad's worldwide inclusion in education, the shortage of published research on best practices is understandable. While current literature addressing similar technologies may provide insights about successful practices, it is imperative to make use of different initiatives in which iPads are used in an educational context, and conduct research aimed at capturing users' insights into what works and under what conditions.

UAE Higher Education iPad Initiative

At the beginning of the 2012/2013 academic year, approximately 14,800 iPads were distributed across 17 campuses of the three Federal Higher Education (HE) institutions of the United Arab Emirates (UAE): Zayed University; United Arab Emirates University; and the Colleges of Higher Technology. This initiative may be one of very few in the world where such a massive number of students and faculty are provided all at once with cutting edge technology to support the learning process. The investment is enormous, and hence the need to identify best practices and quality assurance procedures in an effort to ensure that optimal educational value is achieved.

Currently in the initial phase of a two-year ongoing research, the authors present a preliminary literature review on mobile learning, and describe their proposed research approach and methods of investigation into the iPad initiative implementation strategy at one of the Federal HE institutions mentioned, Zayed University.

Literature review

Technology and Learning

Similar to the early hype around personal computers' ability to change the teacher's role from the *sage on the stage* to the *guide on the side* (Van Dusen, 2000), the iPad is now receiving all the attention. Portability; affordable and ubiquitous access; situated "just-in-time" learning opportunities; connection and coverage; and individualized and personalized experiences are the five affordances that give the iPad its strong edge (Melhuish & Falloon, 2010).

However, the shortage of research on iPad use is understandable and so it is necessary to check the literature on similar devices. While both laptops and mobile devices are not exactly iPads, they share some overlapping aspects with the above-mentioned affordances. The literature on mobile learning is extensive and a major focus has been

on research into its effectiveness and on trends in learning system design, with the majority of findings offering positive outcomes (Wu et al., 2012). There is an indication that mobile learning activities are successful in engaging students (Wang, Shen, Novak, & Pan, 2009), but there is no conclusive evidence relating to its impact on students' performance and attitudes.

While research supports the hypothesis that technology is beneficial for students' performance (Tamim, Bernard, Borokhovski, Abrami, & Schmid, 2011), the naïve assumption that the mere introducion of computers will lead to higher levels of interactivity and constructive learning has been refuted (Bethel, Bernard, Abrami, & Wade, 2007; Wurst, Smarkola, & Gaffney, 2008). Stronger effect-sizes are achieved when technology is used for cognitive support rather than presentational purposes (Schmid et al., 2009) and technology is used to support instruction rather than deliver materials (Tamim, et al., 2011).

The literature on one-to-one laptop initiatives is more extensive than mobile learning. A systematic review of laptop initiatives reveals that they might increase technology integration in learning; improve attitudes toward technology; and slightly increase engagement and motivation (Bethel, et al., 2007). The use of laptops has been associated with an increase in note-taking activities; collaborative in-class learning activities; communication and information sharing; resource accessibility; and improved organization (Kay, 2012; Kay & Lauricella, 2011a). However, research also indicates that individual laptops do not lead to better performance or satisfaction with courses (Wurst, et al., 2008) and may distract those using it in class and their classmates (Fried, 2008; Kay, 2012; Sana, Weston, & Cepeda, 2012). Nevertheless, a structured use of laptops has been found to minimize the distracting influence (Kay & Lauricella, 2011b).

The strongest implication to be drawn from research on laptops and mobile learning is that summarized by Weston and Bain (2010). They emphasize that addressing technology use with a replacement mentality while automating an old teaching paradigm must be avoided. Smart technology use should not be limited to replacing books with Webpages, report cards with student information systems, chalkboards with interactive whiteboards, and filing cabinets with electronic databases.

IPads and Learning

Education has always been accused of lagging behind other fields in reaping the advantages of technology. However, with Apple reporting the sale of 1 million iPads for educational purposes in 2012's third quarter (Mashable Business, 2012), things seem to be changing. This is a new terrain for educational technologists and academicians where cutting edge technology is incorporated and introduced into the classroom simultaneously with its release in the market.

A review of available literature on iPad use indicates that the majority of universities are using iPads for content presentation and delivery purposes (Murphy, 2011). However, the iPad's portability makes it ideal for use in fieldwork, for transporting documents and e-books, and for recording real-time observations and accessing references on the fly (Johnson et al., 2010). The iPad also seems well suited for

learners with special educational needs, due to its comfortable size and weight, its support for audio, and its flexibility in presenting text and images.

From a pedagogical perspective, Mouza (2008) sees the iPad as a catalyst to facilitate the movement towards constructivist educational practices, where teachers act primarily as coaches. Whether for the “flipped classroom” (Bergmann & Sams, 2012) or other forms of blended learning (Greenberg, Medlock & Stephens, 2011), iPads are being used for learning in and out of the classroom. Examples include reflections on using iPad applications to teach business studies (Lennon & Girard, 2012), for communication with students, producing video lectures, and marking assignments (Manuguerra & Petocz, 2011), for offering medical interns higher accessibility to resources (Hill, Nuss, Middendorf, Cervero, & Gaines, 2012), and providing higher accessibility to library resources (Eichenlaub, Gabel, Jakubek, McCarthy, & Wang, 2011).

Caveats

As described by Sharples (2007), mobile learning requires a paradigm shift from teachers, from the more or less stable classroom environment, to more fluid environments in which the challenge is to create enough stability to allow learning to be guided. As well, traditional assessment methods may not necessarily apply, or be suited to these new environments (Taylor, 2006). Hence, for iPads to be used in educationally effective ways, strategic and coherent supports, particularly regarding high quality professional development for teachers (Mouza, 2008), as well as information literacy skills for students is needed.

Nevertheless, while the iPad is being touted as an educational device, it has not been designed primarily for that purpose. Mobile devices, such as the iPad, are not commonly associated with more sustained, deep and formalized learning experiences; instead, device interfaces are designed to be "intuitive enough for high speed, short-term interaction" (Peng et al., 2009). For iPads to be effective, the design of educational applications must be pedagogically sound, rather than focus solely on content, engagement, or 'Edutainment’.

Mobile devices are also associated with using “cloud” (internet-based) applications and “cloud” data storage that can then be accessed from other devices or by group members when working collaboratively. These activities introduce ethical issues in terms of ownership, privacy and security of data. Also, iPad users are dependent on the Apple “ecosystem” of products and services, and Apple may gather personal data, engage in price setting, or limit access to educational sites powered by what Apple alone judges to be 'undesirable code'.

Lastly, failure to objectively assess affordances of devices for mobile learning may result in 'force-fitting' an educational experience to the device, or conversely, a failure to maximize the opportunities available. These failures could result in unanticipated undesirable consequences for early-adopter teachers trying to create learning experiences. The focus must remain on the way mobile learning can be integrated into effective, evidence-driven, innovative practices, so that the learner is empowered and enriched by the learning experience.

Zayed University and the iPad Initiative

Zayed University (ZU) is one of the UAE's Federal (HE) institutions. It is accredited by the Middle States Commission on Higher Education and in 2012 it had 472 faculty and 7,349 undergraduate students fairly evenly distributed across two campuses, one in Dubai and one in Abu Dhabi. ZU has five degree granting Colleges, a foundation program run by its University College (UC) and a pre-university prep program known as the Academic Bridge Program (ABP). Already a laptop university for over a decade, ZU campuses are Wi-Fi enabled, with wireless access in classrooms, the library and concourse areas.

The iPad initiative is currently targeted for the UC and ABP faculty and students. While the 1,818 students in ABP have already received their iPads, slightly over 3,000 students from UC will get theirs at the start of the Fall 2013 semester. ABP and UC faculty are receiving ongoing training to familiarize them with the iPad features and applications, as well as seminars on its affordances for teaching and learning.

Methodology

The current two-year project is in its initial stage. We are planning a mixed-method research design well suited to investigating how the iPad is being integrated into the teaching and learning practice within our vibrant and growing, yet conservative community at ZU. The specific research questions include:

1. How are instructors integrating iPad use in their teaching practices and for what purposes?

2. What are the instructors' perceptions about advantages of iPad use; the challenges to overcome; and needed resources and support.

3. What are the students' perceptions about advantages of iPad use; challenges to overcome; preferences for iPad use to support their needs and enhance their learning experience; and most memorable moments of learning with iPads.

The stages of the project include:

Stage-1: qualitative-data collection from ABP/UC faculty members and students. This will be gathered from conducting focus groups on defining the major themes and issues to be investigated.

Stage-2: qualitative-data analysis with the design, development, and pilot testing of surveys based on the feedback collected in the focus groups. The surveys will include Likert-scale items, close-ended questions and a few open-ended questions to investigate how the faculty members are using the iPads in their classroom instruction.

Stage-3: quantitative-data collection from ABP/UC faculty and students, and from ZU colleges' faculty. This will be coupled with qualitative data collection from interviews with selected faculty members, as well as in-class observations, which will help in providing an in-depth understanding of how the iPads are being used.

Stage-4: data-analysis and interpretation of the findings.

Stage-5: final project report and dissemination of the findings.

Participants will include ZU faculty members and students for both the qualitative and quantitative data collection stages, and ZU colleges' faculty members for the quantitative stage only.

Presently, the research group is in the process of designing surveys and interview questions, and organizing student focus groups and faculty focus groups in order to identify the issues to address. During the summer of 2013, we will analyze the focus group data, design surveys and interview questions, and pilot test the surveys in order to refine them. Submission of a paper to disseminate our preliminary findings is expected in the Fall 2013.

Conclusion

We have ushered in the 21st century with formidable ubiquitous mobile computing power, transparently connecting people and resources and irrevocably changing how we live, how we learn and how we help others learn. However, for the iPad, or any other mobile multifunctional connecting device, to become an enabler that enriches the learning experience, a structured evaluation of its implementation into the teaching and learning environment is paramount.

As we examine the deployment of iPads in HE, a concerted effort must be undertaken to expand the scope of investigations into all facets of its integration into the university classroom. While the current literature addressing similar technologies may provide insights about successful practices, due to the large financial outlays apportioned to initiatives targeting iPads for mobile learning in HE, every effort must be taken to ensure that optimal educational value is achieved.

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Adaptive Course Design for WBI

Lung-Mei Hsiao, Fong-Ming Shyu

NUTC, Taiwan

0266

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Abstract

Recently, with the popularization of end devices such as computer, mobile, and table PC, increasing number of web designers and developers recognize the importance of Web Standard. There are numerous advantages, inclusive of enhancing website maintenance and ensuring accessibility. The related techniques are not only cozy for people with disabilities such as visually impaired, but ease mobile access to web content. Because of mixed-ability grouping in physical classroom, it is constructive to exploit the updated functions of HTML5 or CSS3 for online course design, as to accord cognition style adaptively. By analyzing example website shows that completely separating layers into structure, show, logic and data are effective and practicable. We also find out jQuery Mobile could be a useful tool for web re-design on mobile devices.

Keywords: *Web Accessibility, CSS3 speech, nonverbal communication*

1. Introduction

1.1 Objective and Significance

In the first decade of the 21st century, secondary school in Taiwan with the adoption of mixed-ability grouping was one of the main policies of education. Beyond traditional curriculum, Web-based Instruction (hereafter use "WBI") has become extension of physical classroom, for the hypermedia is helping to realize the individual learning.

For technology implementation is relevant to teachers' information literacy、media creativity、social competence and responsibility. Mentioning to on-line classroom, open source accords to the principle technological minimalism, and not only dynamic effect but interaction are available. Content Management System(CMS) is useful tool, however, it's necessary to possess know-how of program while customization[Martinez and Jagannathan 2008].

1.2 Listening model

Listening plays the vital role in daily communication. In academic setting, comparing to speaking、reading、writing, listening is the first acquired skill in language learning; Study of time spent communicating shows that students in secondary school listen for as much as 67% of their day[Swanson 1984]; core preparation for graduates to enter workplace includes listening skill.

The listening process is in a sequence of behaviors：receiving; attending; perceiving; interpreting; and responding. Not audio-only stimuli but other senses such as visual channel、smell、taste、and touch impact the listener's .presence of receiving. Span and energy of attention influence a listener's ability to attend significantly. As Fig.1 shows, it is obviously that listening behavior is complex—the dimension probably occur in sequence or in simultaneity, and the core of every stage of this process are communication influencers[Wolvin 2012].

Research of listening focused on key influencers — physiological, psychological, and contextual. Age and gender bring differences in attention styles and cognitive processing styles. Attitudinal state effects the willing to listen, while it depends on both communication apprehension and listening preferences. Four identified listening styles（people-oriented, content-oriented, action-oriented, time-oriented）[Watson et al. 1995], and listening type , personality style, etc. are variables to enhance or impede effective listening. Roles, culture and time are contextual influencers shaping the listening experience.

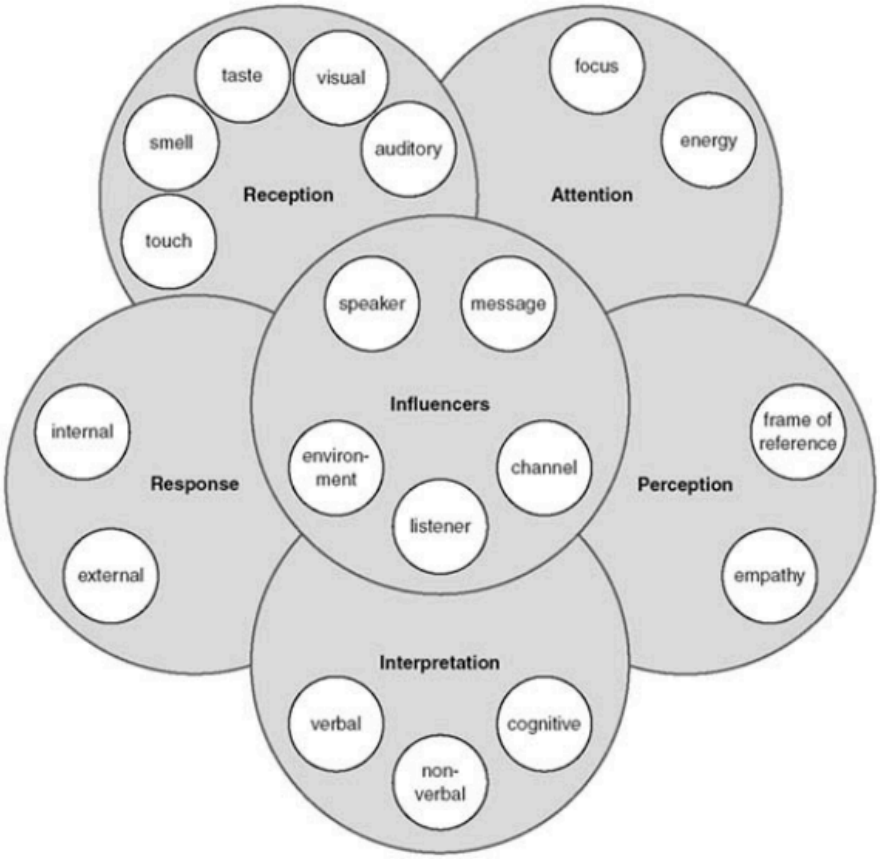

Fig.1： Listening Model (Wolvin, 2012)

Generally we access the WWW or Internet visually, while navigation by voice is helpful when walking or driving. Voice-based user interface provides alternative to access information for especially the visual impaired[Zhu et al. 2010]. Besides of disable permanently, resulting from cognition or physical injury temporally, assistive technology is essential. And further, the impact from rapidly aging world[Zhou et al. 2012]. As a result, we discuss the aural presentation in application of course design for WBI, and choose the basic music theory as the digital material. In order to promote the capacity of secondary school's students who cannot read score, the digital material include theory skills and ear training, combination with visual and aural elements.

2. Related work

2.1Verbal and Nonverbal communication

Listening is a critical factor in academic success. With the diversity of situation, the interaction between speaking and listening is one of the most complex human behaviors. Features such as timing to speak, pitch, pet phrases, and so on which are not relevant to colloquialism itself directly are critical clues for comprehension in communication. In other words, either what you say or how you say it is important and parallel. The related researches of paralanguage[A.Hall 1992] include level and change of pitch, level and change of volume, speed, rhythm, length of the sound, pause、resonating voice, precise or vague pronunciation, speak inserted dummy words（like "ah"）, take turns and tacit response in conversation.

Because of judgment from paralanguage stimuli, it attributes to personality or

emotion[Argyle 1998]. Users will infer the social role by interacting with computers. This is why almost talking machine (like GPS) take the female voice as the default voice prompts. Stereotypes that female is relatively no-threatening exist in people's minds, and affect the social perception. However, older adults prefer natural male voice as the navigation aid on PDA because for understanding more easily[Goodman et al. 2005]. Proper length and speed of audio navigation aids should be applied, too. Fig.2 displays the location of some style properties from CSS3 speech model[Chung 2011].

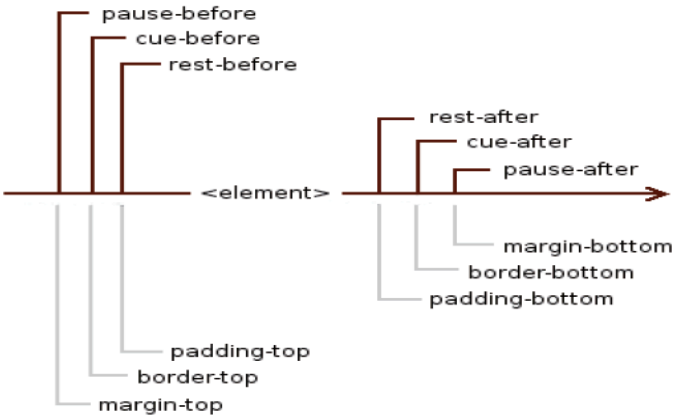

Fig.2

2.2Auditory User Interface（AUIs）

In the field of HCI there have been documented that AUIs such as earcons, auditory icons, soundtrack, and so on accord to acceptance and usability. The functions, for example, are attracting attention, diminishing the amount of information on the screen, and helping the visually disabled or textually illiterate to navigate or access the information on the websites[David Benyon 2009]. Besides, elderly-specific or no screen phones demonstrate the speech-to-text technology. For ordinary people, auditory modality may be important in multitask environment[Fickas et al. 2008]

2.3Web Accessibility

Designing and building web with normative specifications of technologies and methodologies bring numerous advantages, principally to promote accessibility of more people and more types of mobile devices. By an investigation from Opera of 2008, more than 95% that websites had useless tags and codes. Ignoring web standards results in slower download speed, deficient appearance, poor functionality, etc.. In contrary, with standard compliance ensure user experience, access to content, menu usability, and predictable behavior. Moreover, accessible techniques improve the overall quality of websites.

Assistive technology(AT) refer to devices or tools that using for web browsing by people with disabilities, such as screen reader is for the visual impaired. Due to voice modality, design strategy should involve these two groups simultaneously while authoring content[Sikos 2011]. Distinguishing layers of content, structure, presentation, and behavior is effective and practicable.

3. Materials and Methods

3.1analysis

First step is to analyze "teoria", an award-wining web site about music theory, for it providing exercises versions to PC and mobile individually.The mobile

version(http://www.teoria.com/mobile/index.php?l=en) have 4 levels hierarchical menu：index/options/exercise/end or reset. Taking the second level of deep menu for analysis and it's file construction can be separated to four layers, as Table 1 shows：

Table 1：file construction

Layer ***stadards***	**file**	**Function**
structure *XHTML1.0*	clef.php	XHTML file of substance
presentation *CSS2.1*	mobile.css	CSS file of wrapper
logic *Javascript* *jQuery*	jquery.min.js Note.js Interval .js clef.js clef_exe.js StaffView.js notePanel.js commonPanel.js common.js ClefOptins.js	Three kind of choice to choose clef, notes over, and show notes in group by putting a check
content *text* *image* *audio*	options.gif back.gif clave-(7 types) (below are excluded)	Images of clefs and bottons

3.2 re-design for mobile devices

Through the test of mobile version pages on a 3.5 inch smart phone, we found that it's necessary to magnify the pages. In consequence, we adopt jQuery Mobile to develop a Mobile HTML Application for re-designing. It's a framework based on jQuery, using Markup-driven to set and layout UI, and cross-platform. The execution environment for jQuery Mobile is：

- Opera Mobile Emulator(see Fig.3)
- Server2Go
- jQuery Mobile

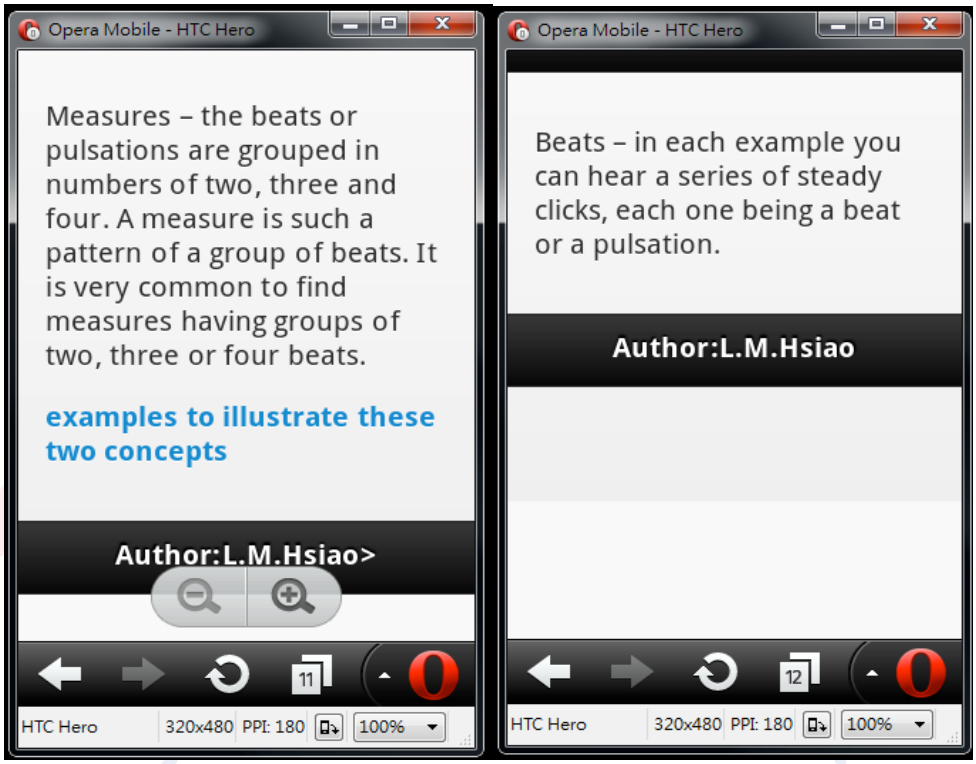

Fig.3

4. Summary and Discussion

Previewing web pages on mobile emulator can confirm the usability about input, output, menu, and part of functions. Referring to the realization of aural navigation, combination of PhoneGap and jQuery may facilitate accessibility for PhoneGap API on Capture, Media, and Notification. These provide function to scratch multimedia data, play or record audio file, attract users' attention by sensory acuity of auditory、visual、or tactile. In another way, Screen Reader such as aiBrowser is useful to simulate voice-based navigation on PC, though learning curve exists and time costs. In practice PC is more available than handheld computers for students in secondary schools.

In addition, the emerging HTML5 provides new functions or upgrade ones, especially with the new tags about local multimedia content <audio>、<video>. Under development of Web Standards imply the power of the web is in its universality and potential in online entertainment, education,, and so on.

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Exploration of Dynamic Identities in Interaction Design

Ming Chieh Hsu

Yuan Ze University, Taiwan

0294

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Abstract

With a variety of platforms and media vehicles, designers not only have a challenge on new concepts such as varied expression forms, elements, principles, and aesthetic concepts, they also have to take into account users' cognitive tendencies and social media aspects during the design thinking process, especially in trying to enhance the user experience. Dynamic identities aim to improve a traditionally static visual experience with a multi-dimensional angle. In addition, not only does interaction design express creativity and cognitive philosophy via all senses: sight, touch, smell, hearing, and taste, it also combines psychological perception with aesthetics. "Interaction" is a process of communication, which influences both cognition and mentality. This study is based on three key factors/aspects of interaction aesthetics: cognitive level of recognition, physical level of functionality, and psychological level of emotion. Forty-four dynamic identities from January 2011 to July 2012 were studied with a case study method, analyzing the design process and related principles. Through focus groups and in-depth interviews, this study investigates the concept of interaction design to classify three types of dynamic identities: "functionality," "entertainment," and "identification." Different characteristics of media and platforms are analyzed by framing the corporate identity system to form a unique dynamic identity. This paper proposes that functionality dynamic identities give rise to the "customization" and "modularity" design principles; whereas entertainment dynamic identities bring forth the "aesthetically pleasing" and "entertaining" design principles. Moreover, through the user-centered design experience a "personalized" design principle is born.

1. Introduction

Communication techniques experienced numerous revolutionary changes. In the late 20th century, computer brought forth the information revolution, which made the prospect of information society more immediate. With the aid of digital media, communication media has developed several variations and this made people change the method of information-collecting and reading, also changing the channel for industry brand communications, and marking a big step in identity strategy (Wang, 2005). The creative process for brand identity needs to combine investigation, tactical thinking, excellent design, and management techniques, which is a scientific process (Wheeler, 2009). Digital media and interactive media are different from traditional print media, the communication angle, method and audience relationship are different as well, therefore a traditional static logo is harder to fulfill the need of multimedia communication. Interaction and immediacy make a logo more vital, and the relationship between the network and audience is closer (Liu & Guan, 2009). The diversified form of digital media changes the techniques of brand identity design, and dynamic identity is one of the best applications to present a company's brand image, and through the superiority of digital media, a company can more easily win the competition (Budelmann, Kim & Wozniak, 2010; Wheeler, 2009). Therefore, the influence of interactive design aesthetics on dynamic brand identity, the research of design thinking and design principles is the main motive of this study.

2. Literature Review

2.1 Brand identity and dynamic brand identity system

A successful industry brand always has an excellent industry identity system, with the business activity and culture that signify this business, to increase symbol recognition through different media (Lin, 1985). Brand identity is a brand's external image which a business organization expects to represent itself, it is able to make consumers easily identify its uniqueness, significance, value, and personality (Kapferer, 1992; Aaker & Joachimsthaler, 2002). Through products, or the function, name, logo and visual system of service, marketing messages are sent, consumers can see, touch, own, hear, and watch the logo moving, and all kinds of methods are used to establish it in different media (Upshaw, 2000; Wheeler, 2009).

The dynamic identity shown in digital media almost has the element of timeliness (animation and dynamic image), and in its creation, the designer should notice if it definitely provides the essence and character of the brand, and transfers the connotation of a static image into a dynamic image presentation. In presenting the dynamic identity, dynamic method should be used to state and perform the brand, so the brand's rhythm and speed determine the result and also the identity's appeal (Wang, 2005; Mollerup, 1999; Rawsthorn, 2008; Wheeler, 2009). With the booming of mobile devices, the development of dynamic brand identity will change along with the development of technology, furthermore, for customers, there is room to explore the brand image from within the dynamic brand identity. In the brand identity field, using animation or dynamic images combined with trademarks for visual identity and image design, and thinking of different communication media and platform's character while designing a whole brand identity concept will create a dynamic identity with unique style (Hsu & Chen, 2011).

Based on many scholars' research, including the analysis of brand strategy of various industries, clarifying characteristics of industry, consumer markets position, market segment analysis, and strategic motivations, goals or market cycle targeting, etc., now is the age of diverse media and platforms, whether using visual or tactile elements of the brand, cross-cultural issues should be addressed, especially for the element of brand identity, such as naming, the difference between symbolic object and brand attitude; the market segmentation positioning, color, the difference of visual culture preferences; avoiding the conflict of pronunciation and homonyms; and the expression of visual image across language barriers (Liu & Guan, 2009; Vaid, 2003; Wheeler, 2009).

2.2 Interactive design aesthetics and dynamic brand identity

Tremayne & Dunwoody (2001) found interactivity to be a cognitive process, and the perceived interactivity has influenced the effect of message-perceiving strategy in users. Understanding the need of users confirms the main goal, usability is the core of interactive design, and the goal of user experience is the quality of defining the user experience, which is a subjective experience containing the feeling within the interaction of users and products. Many scholars brought up the theories that interactive design is not only concerned about the high efficiency or high productivity of the design, but concerned more about the characteristics of interactive design, such as being satisfying, enjoyable, fun, entertaining, helpful, motivating, aesthetically-pleasing, supportive of creativity, rewarding, emotionally-fulfilling (Norman, 2007; Sharp, Rogers & Preece, 2009).

In perceptual stimulation, everyone's identity and interpretation is based on the scientific perception experiment, when looking at the brand, we first recognize the shape. When type is interpreted for its meaningfulness, the visual image is the first to be remembered and recognized. The brain reads color after it registers shape, and before it reads the form, therefore an easy-to-recognize shape is necessary; color can arouse feelings connecting to the brand; then comes the form, when brain is in the process of dealing with visual language over and over again, it will notice details in the content (Wheeler, 2009). Observing from symbols' alterability, in an identity system, every element of symbolic expression could be highly stable, and could also be altered randomly. However, a dynamic style often creates a creative aesthetic, and provides a unique charm (Wang, 2005). The scholar Wheeler further interpreted the brand identity design process as thinking of the visual dimension of the brand trademark, such as a main color and any secondary color combinations, scale, proportion, typography, imagery and the performance of motion, form, style, and focus in media like photography, illustration or iconography. And for the tactile dimension of the brand identity system, including experience and emotion, one is media texture, hand touch, weight; the other are interactive qualities such as package structure, or the sense of hearing and smell, and how to arouse in people the association and recognition of hearing and smelling (Vaid, 2003).

Stone (2010) specifically brought up the elements of design aesthetics, he explained that design aesthetics is a design process, meaning that design elements should thoughtfully fit with public awareness and emotion. This study base on the theory of Norman (2004), and also integrate the scholars' discussion, the interactive design aesthetics originates from user experience, and its formed elements: (1) cognitive level of recognition; (2) physical level of functionality; (3) psychological level of

emotion (Norman, 2007; Ross, Overbeek, Wensveen & Hummels, 2008; Locher, Overbeeke, & Wensveen, 2010; Stone, 2010). Further analyze the design thinking and principle of dynamic brand identity.

3. Research Method and Case Analysis

This study mainly researches the influence of interactive design aesthetics on the dynamic brand identity system. It researches and generalizes 44 cases of dynamic brand identity around the world, analyzes the relationship between interactive design aesthetics and design thinking, design principles; establishes the classification and the design thinking of the dynamic brand identity system through three experts' focus group seminars (5-7 person). Preliminary data is based on the analysis of the coding from document review, from exploratory research, developing a more apparent concept, establishing priority, developing an operative definition, and expecting to have further understanding of the study subject. This study uses case analyses based on related literature in design aesthetics and interactive design aesthetics, integrates the elements of interactive design aesthetics, and analyzes the design thinking and design principle of 44 cases of dynamic brand identity from a cognitive level of recognition, a physical level of functionality, and psychological level of emotion.

Operative definition:

(1) The cognitive level of recognition which includes recognition, familiarity and memorability; design aesthetics refers to the relationship between various shapes, colors and material, the interaction between proportion, contrast, and size, also the visual balance of order, diversity, and rhythm (Stamps, 2000).

(2) The physical level of functionality which includes customization, which should be rewarding, easy to use, motivating and supportive of creativity; interactive design aesthetics is visual, tactile perception is used at the same time, as a designer we hope to understand how to achieve the goal of usability (Locher, et al., 2010; Stone, 2010).

(3) The psychological level of emotion which includes enjoyable, fun, aesthetically pleasing, emotionally fulfilling and entertaining qualities. Interactive design aesthetics means pleasure and fun in aesthetics design, and designers design to achieve interaction and integration (Norman , 2007).

In addition, this study is based on related literature for brand identity system design principles, there are 16 design principles for the dynamic brand system, which are simplicity, globalization, sustainability, legibility, consistency, uniqueness, attention, description, repetition, flexibility, modernness, extendability, systematics, aesthetics, renovation and understanding, and will be clarified in these 44 cases.

Dynamic brand identity case analyses

Synthesizing 44 cases of dynamic brand system identity, and analyzing by industry, which includes information industry, such as cloud service, mobile device platform, mobile application and information science, communications industry and telecommunications industry; traditional industries such as the wheel manufacturing industry and consumer goods company; service industries, such as general merchandise, hair salon and accounting firm, agencies and digital printing company;

cultural education industry, such as music hall, museum, exhibition, school and seminar, and emerging technology-based media lab; tourism industry, such as design of an international city image and a tourist city image; the biotechnology industry, welfare organization and political organization. In the global dynamic trademark distribution, there is USA and Canada in the USA & Canada area; Switzerland, Finland, UK, Norway, Portugal, France, Spain, Netherlands and Germany in Europe; Australia, India, Korea, and Russia in Asia; and Brazil in South America.

1) Cognitive level of recognition

As for cultural education industry, take the Finland Playlab studio for an example. Playlab is a practical place for creation, which focuses on fun and is the combination of community, education, entertainment and activity. Their subtitle, "The Imagination Gym" refers to devising activities which challenge people to engage with both sides of their brains, and the full scope of their creativity. With multi-disciplinary skills they tackle marketing and promotion projects for business, retail, museums, galleries and public organizations. The brand identity uses words and symbols, Playlab is a workshop space aimed to be a creative playground for stressed adults, and aimed at creating a playful space. Their identity system and website was designed by Mind Design company in London (2011). On the envelope and letterhead the actual logo is just blind embossed, and illustrations use a mixture of scientific elements and random fun images. The stationery is printed in red, yellow and blue, and the address details are filled in using a rubber stamp. Logo changes when applied to different media.

As for the telecommunications industry, take Nokia Siemens Networks for an example, it is the second biggest mobile telephone network equipment manufacturer in the world. The merger of Nokia and Siemens' network businesses presented a uniquely challenging branding opportunity – that of creating an entirely new identity for a brand that would be a €6 billion market leader – Nokia Siemens Networks. For Nokia Siemens Networks, an identity that thrives across all platforms was successfully created – a living, breathing brand that is multi-sensorial, multi-dimensional and highly impactful. The brand was launched in February 2007 with a film produced as part of the branding process, which was lead-designed by Moving Brands (2007). A full identity system was created that worked across print, onscreen, audio and interactive media. Deliverables included logo, mnemonic and Sonic Mnemonic® (moving and audio logo), a suite of sonic assets (including music and ringtones), brand films, photography, stationery, typography, signage, livery, environments, and pictograms, as well as look and feel and usage guidelines across all touch-points.

Design aesthetics is the recognition concept of sensory, is a theory of free art, is art thinking of all kinds of beauty, a rational art, which is similar to philosophy thinking; moreover, it is a science of sensory recognition (Baumgarten, 1987). From the operational definition of the cognitive level of recognition and design principles of the traditional brand identity system, the identification, attentiveness, and visual consistence of brand identity is noted, therefore, we classify this type of dynamic identity as "identification" dynamic brand identity.

2) Physical level of functionality
Take the MIT media lab for example. Its new visual identity is inspired by the community it comprises: Highly creative people from all kinds of backgrounds come together, inspire each other and collaboratively develop a vision of the future. Each of the three shapes stands for one individual's contribution, and the resulting shape represents the outcome of this process. Therefore, the brand identity has three intersecting spotlights and is based on a visual system and a custom algorithm that can be set into 40,000 arrangements and 12 color-combinations. This is meant to reflect the constant redefinition of what media and technology means today. The algorithm produces a unique logo for each person. Each person can claim and own an individual shape and can use it on their business card, letterhead, web site, animations, a personal web site, signage, etc. A custom web interface was developed to allow each person at the Media Lab to choose and claim an own individual logo for his/her business card, as well as a custom animation software which allows the creation of custom animations for any video content the lab produces. The intersecting spotlight paths highlight the fluid collaborative approach that the institution takes in applying dynamic thinking to research and solutions (Allen, 2011).

Headquartered in New York, Seed Media Group is a diversified media, technology, and professional services company committed to advancing science and its potential to improve the state of the world. The identity is designed by Sagmeister, and the logo manifests science as looking at the world through the lens of the phyllotaxis (Macnab, 2008). In 2006, Seed Media Group commissioned Jonathan Harris to elaborate on this identity with digital media and information visualization. In 2008, Seed Media Group brought designers and scientists together for a conference organized in partnership with Parsons The New School for Design, MoMA, and also collaborated with Toshiko Mori and Michael Meredith at the Graduate School of Design at Harvard on a real-time data visualization project for the World Economic Forum. In 2009, Seed Visualization was founded and began to develop data visualization projects for companies and organizations. In 2010, Visualizing.org launched, the mission is to help make data visualizations more prominent across the web as a way of understanding complex world issues. The site is open and free and operates under the Creative Commons non-commercial license. It created a space for designers around the world to regularly upload and share their public work with a large audience and have it "used" by the public in discussions about issues like health, energy, climate, cities, food, and globalization.

Cultural education industry: Take the Casa da Música (Porto city, Portugal) for an example, designer Stefan Sagmeister created the logo in a three dimensional form; it was then converted into six different logo marks comprising the top, bottom, north, south, east, and west views of the building. The Sagmeister team created seventeen points on the image, recording the color values of each point in the image, then transferred onto the 17 facets of the logo. This provides the colors to be used in the logo, and creates an endless possibility. The architecture itself is a unique geometry, from different angles one can create different requests. The building is a visual element, and creates a dynamic, faceted and endlessly varied identity. Avoiding another rendering of a building, the design developed a system where this recognizable, unique, modern form transformed itself like a chameleon

from application to application, where it changes from media to media, and where the physical building itself is the ultimate rendering in a long line of logos. Meanwhile, the goal was to show the many different kinds of music performed in one house. Depending on the music playing the house changes its character, and works dice-like by displaying different views and facets of the music (Albinson & Giampietro, 2011).

The interactive design aesthetics operating process creates an involved feeling in the user, which surpasses participation itself, and through the result of chosen behavior reaches pleasure (Norman, 2004). From the individual cases above, the design thinking process integrates emerging technology, using the concept of data's automatic placement, mathematics, program calculation, and system module, creating a result of data visualization, and also derives unique design characteristics of customization and personalization. From a physical level of functionality in the definition of interactive design aesthetics, we classify this type of dynamic identity as "functionality" dynamic brand identity.

3) Psychological level of emotion

The biotechnology industry: Take 23andMe as an example, 23andMe is a privately held personal genomics and biotechnology company, founded in 2007, it develops new technology and methods in providing clients with genetic information. The company is named for the 23 pairs of chromosomes in a normal human cell. The variety of 23 distinct yet visually unified logos plays conceptually on the human chromosome, good for packaging and dynamic images. The visual space surrounding the identity is bright, but not stark, as this is one of the most unique visual elements, highlighting the boldness of 23andMe's unique immersion into consumer genetics. A single version is used consistently with the company name, but different colors and pattern variations can be used across application to create a variety in print pieces and on the internet. The form in the logo represents chromosomes; their many and varied transparent colors show up again and again in unique combinations. Every one – that is, everyone – is different (Fishel & Gardner, 2011).

Politic organizations: Take the 2008 American Democratic Party's Obama presidential campaign as an example. The logo was designed by Sol Sender on assignment from Chicago-based Mode Project motion design studio. The concept is the "O" of his name and has the idea of a rising sun and a new day; the sun rising over the horizon evokes a new sense of hope. In the 2008 Obama presidential campaign, different from the campaign trademark used before, there are two constant components for the Obama campaign identity. One is color (white and blue), and the other is the symbol (a sunrise with red stripes of the U.S. flag at the base). Sender created a standard for a consistent identity system, and there is cohesiveness throughout, from the simple logo and how it expands and connects with people of different areas, via different media to different groups, aimed at different voters, such as Hispanic Americans, females, gays, bisexuals, and voters of various beliefs (Rawsthorn, 2008; Gomez-Palacio & Vit, 2011).

Cultural education industry: Take the 17th Biennale of Sydney as an example, the visual identity was designed by London designer Jonathan Bambrook, and the biennale's subtitle was inspired by American experimental filmmaker,

anthropologist and musicologist Harry Everett Smith. He released a boxed set of historic recordings entitled The Anthology of American Folk Music in 1952. Barnbrook took inspiration from Everett Smith's work to develop a modular identity system for the festival comprising of a “myriad” of typefaces, shapes, patterns and illustrations that can be combined and applied to several activities. The identity is based around a modular system of blocks, the modular blocks are uniform in shape to allow for easy tessellation. There are two layers. One layer’s blocks are of abstract shapes, and the other is of geometry and halftone printing techniques. The design showed a disorderliness containing word information and illustrations, drawn from old medical reference books, stills from Smith's films, astrological manuscripts, and the geometrical shapes from Victorian era medical illustrations, crystal structures, and mathematical text books. Many typefaces were designed by Bambrook himself; using typography as a modern language, an important element is the combined concept; using black, red and white, all the designs still contain flexibility and recognizablity, and can be applied to catalogue covers, websites, banners, posters and signages. (Albinson & Giampietro, 2011).

Interactive design aesthetics involves visual and tactile perception used in the same time, through vision to reach interaction, where interaction can surpass the visual contribution (Locher et al., 2010). Design thinking in this kind of identity system has diversity and extension, uses many collages, a module concept, sometimes uses static visual elements as the base, and uses different materials and art styles to change the visuals and provide pleasure and fun. From a psychological level and referencing interactive design aesthetics, we classify this type of dynamic identity as the “aesthetically pleasing” dynamic brand identity.

4. Discussion

In the process of synthesizing and collecting data, it was hard for this study to collect design related data in other languages, especially Japanese and Spanish, therefore, this study can only base conclusiongs on English-based data. Compiling data demanded accurate and definite brand identity system standards, design concepts and designers related information. Compiling 44 cases of dynamic brand identity, categorized by industry, information industry is 22.7%, communications industry is 15.95%, telecommunications industry is 6.8%, traditional industry is 6.8%, service industry is 11.36%, cultural education industry is 20.5%, media lab is 4.54%, tourism industry is 4.54%, biotechnology, welfare organization and politics organization industry is 2.27%, Overall, telecommunications media and emerging technology related industries are 34.04%. In global distributions of dynamic trademarks, U.S. and Canada is 31.8%, Europe is 54.59%, Australia is 4.54%, Asia is 6.8%, South America is 2.27%. Overall, countries distributed in Europe and America are at 86.39%, the usage of dynamic brand identity outside of the Europe and America area are still mostly presented in the traditional static method.

The study of interactive design aesthetics is divided into experience and expression: studying someone using computational things (experience), and building computational things to be used by someone (expression), interactive design aesthetics holds a double focus on both issues, making the foundations somewhat different from traditional product design (Petersen, Hallnäs & Jacob, 2008). In dynamic brand identity seen from the viewpoint of “interactive design aesthetics,” the

"identification" is 20.5%, "functionality" is 27.27%, "aesthetically pleasing" is 52.23%. For pleasure and entertainment the new media brings, Kerr, Kücklich and Brereton (2006) thought the core elements include control ability, situational immersion, storytelling, and narrative ability (Schrepp, Held & Laugwitz, 2006). The attraction of a product or brand with entertaining character has the same influence on the actual character, and the entertaining character is also an important element in creating fascination (Hassenzahl, Platz, Burmester & Lehner, 2000). Based on the analysis of 44 cases of dynamic brand identity and the basic design principle of a traditional brand -- from the "identification" dynamic brand identity system, "functionality" dynamic brand identity, and "aesthetically pleasing" dynamic brand identity, we can also infer the design principle of the dynamic brand identity.

The case analyses of this study showed that functionality adds the design principle of "customization" and "modularity"; and that entertainment could foster in people the desire of play, and curiosity could bring the exploration of learning materials, and that pleasure and entertaining elements exist in interactive design aesthetics. Dynamic brand identity with the "aesthetically pleasing," concept in its design has diversity, extension, and uses lots of collage and modular elements. Or it uses basic static visual elements as base and different expressive materials and artistic style to change the visualization, and to be aesthetically pleasing and entertaining. Therefore, the emotion level enhances the design principles of "aesthetically pleasing" and "entertaining," and a user's unique personality makes the brand identity have more emotions and activity, so the design principle of "personalized" becomes ever more important (Rawsthorn, 2008).

4. Conclusion and Suggestion

This study is based on the analysis of 44 cases, which shows dynamic brand identity from the viewpoint of "interactive design aesthetics," and from recognition, functionality, and emotion. There is the "identification" dynamic brand identity, "functionality" dynamic brand identity, and "aesthetically pleasing" dynamic brand identity. In recent years, the trend of "functionality" dynamic brand identity has flourished, but the "aesthetically pleasing" dynamic brand identity, which uses different media and art styles to change the visualization, still has the largest percentage. Nowadays, designers face challenges in diverse expression, design elements and principles, aesthetic concepts and trends, and the audience's mentality and social media. In creative thinking, we still need to note if the design clearly fits the nature and personality of the brand, and transfer contents from the static image to the dynamic image.

While considering different communication media and platforms, we need to insert the whole brand identity concept, create a unique style of dynamic brand identity design; for the visual and tactile dimension of visual elements, we also have to consider cross-cultural and cross-ethnic issues. Design thinking should gradually integrate technology in the identity system, using both the concept of automatic data placement, mathematical operations, program algorithm, and system module, to create data visualization, and to also maintain design aesthetics from traditional brand identity, which is very important. Moreover, for different types of dynamic identities really conveys the implications of the corporate brand, or what differentiation in

cognitive meaning there may be between various types of dynamic brand identities, there could be further discussions.

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Voice Control Mode of Operation Used on Mobile Devices

Cai-Yi Jheng, Chung-Hua Chu

National Taichung University of Science and Technology, Taiwan

0299

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Abstract

This paper surveys a novel speech application on the Mobile Devices. Traditional speech interfaces such as Apple Siri and Google Voice Search cannot directly handle system setting on the mobile devices. Therefore, this thesis presents a friendly user interface based on a voice-controlled API.

I. INTRODUCTION

In the era of updated technology, mobile devices are modern essentials for everybody. Mobile device is a portable and convenient electronic equipment of multiple functions including display and touch control as well as powerful computing capability. The functions of the mobile device are diversified and it has the basic operating capabilities of conventional PC. Hence, due to personal use and rapid information flow, the use of mobile devices has been growing by years. As suggested by the surveys of ACI-FIND in previous years, in terms of "Mobile Internet Penetration Rate" growth trends (Figure 1), the mobile Internet penetration rate of Taiwan reached 10% in Q1 of 2009. In recent years, due to the gradual maturity of mobile communication technology, mobile Internet devices have become the most popular 3C consumer products. As the information of the following figure has suggested, the Mobile Internet penetration rate of Taiwan in 2012 ha reached 31.9%.

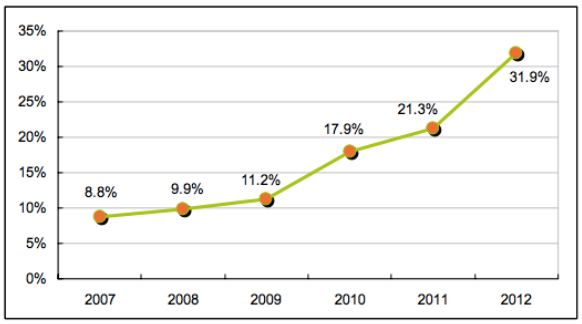

Figure 1 Changes in the mobile Internet penetration rate of Taiwan in 2007-2012

According to the above information, the number of users has increased year by year. The impact of the mobile device penetration is that the contents of mobile device have been making constant progress, providing users more conveniences in use, search, and ready access and reminding. Voice control can be applied in mobile device applications.

II. RELATED WORKS

A. Voice Application Development

The most well-known voice applications at present are Apple Siri intelligent personal assistance and Google Voice Search. Due to the unique intuition without spatial limitation of the voice technology, it has gradually become a new interface of mobile devices including applications such as voice control, voice input method, voiceprint identification. The core of the voice technology is the speech recognition technology (SR) that converts voice into text. The recognition capability of SR engine landed in a development bottle when it achieved 80% accuracy in early 21st century. However, after the Cloud computing of voice platform, SR engine has made major breakthrough in recognition capability after huge amounts of modification and learning of voice samples. The major voice technologies for mobile devices (Figure 2) and relevant companies are: [1].

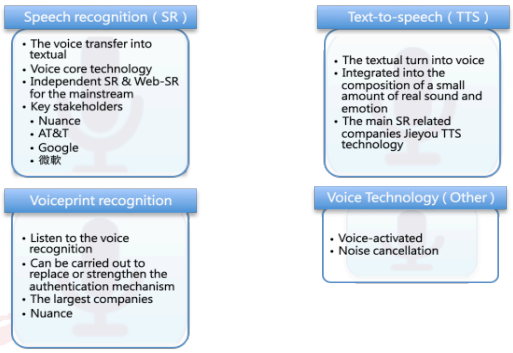

Figure 2 Major mobile device voice technologies

B. *Speech recognition tools*

CMU Sphinx is an open tool speech recognition engine released in 1999 as the open-source code. It is mainly established in ASR (Automatic Speech Recognition) applications and supports multi-platform development. During the research process, the SR development tool of PocketSphinx is used for the offline speech recognition on the Android platform. [2][3]

Android Speech is a Google speech recognition, which is realized by the Server by the division of the API of Android. Speech into application end API and Server end API. It can establish and identify the engine Server; however, the identification results should be fixed. If using Google Server as the engine, it requires Internet connection to conduct the recognition. Meanwhile, implemented in the Server, it is not open in relevant information such as the source code. (Figure 3) is the Google Recognition Server structural diagram[4][5] divided into two parts of the applications and the framework; in the application part, speak now dialog is used by means of Use Google activity of SEMC Car APK on GUI (Graphical User Interface). The means of Use Google Service is to use Recognizer Service to realize Speech Reognizer.startListening (intent) before executing the VR service interface in the Android Voice framework in VR (Voice Recognition) Service. However, the Android interface part is of the open source code.

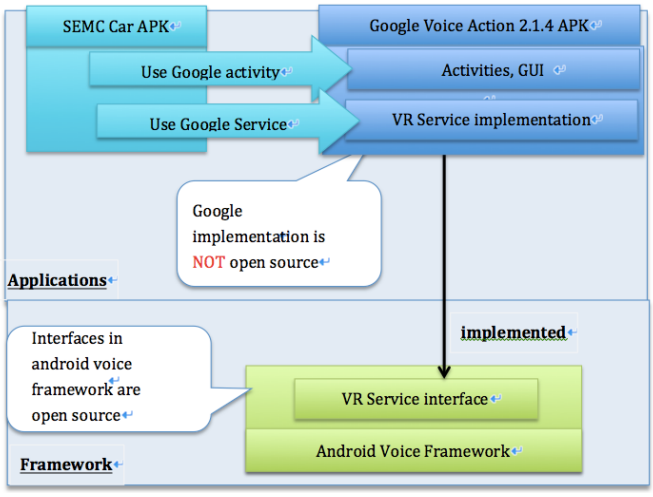

Figure 3 Google Recognition Server structural diagram

Dragon Mobile SDK Reference is the SR and text-voice service that can be built in applications. The database provides Server with voice processing components through a clean and non-synchronized network service API. API speech database mainly provides quick voice search, dictation, high quality and multi-language text-voice conversion function [6].

C. *Voice control and set the system user interface menu*

Apple Siri is the most well-known intelligent personal voice assistant of voice control, which uses the speech recognition technology developed by Nuance Company. It has certain capabilities of understanding the speech and recognizing the intent of the users. It can be used to kill the time and its main function is to help the user in handling some matters such as search, checking the weather, ordering a meal or a cab.

The aforementioned subsystems are executed in order in analyzing the event input by the user to understand the true intent of the user and provide useful services accordingly [7].

Input system supports multi-module status input including not only the voice recognition but also the text input, GUI operation and event trigger. Ambiguous meanings can be eliminated from the early input by the language interpreter in addition to the multi-module status input. In addition, the user input can be consciously guided, so that the user input can be truly reflected to Siri as possible to provide services.

Active body is an important concept in Siri. It can be regarded as the place for the specific execution environment of Siri. The execution system uses all the system data, dictionaries, models and programs for the parsing of user input in the “active body”, and interprets the text message as the true intent of the user before using the external services accordingly.

The execution system is the most technical part of the Siri system. The aforementioned “active body” is the place for the concrete processing of all dictionary resources and modeling resources. The actual processing is implemented by the execution system. The execution system does not only parse the original text input of the user by the internal semantics, it also determines the content of the next sentence that Siri should say in the interactive process between the user and Siri.

The service system is the service-oriented user intent recognition system. Regardless of dialogue control and task control, the fundamental purpose is to guide the user to Siri before providing a specific service to achieve the purpose of accomplishing certain task or solving a certain problem.

The output system is ultimately to provide the service results or content of dialogue process to the user. It does not only support voice, E-mail, text and other multi-module outputs, but also the personalized functions such as interface setting as well.

Menu (or functional list) is a set of limited options displayed on the interface. The menu options are usually simple textual descriptions including images, buttons or checkboxes. For the efficient use of menu, the option description, image content or button description should be clear and easily understandable to the user. It is more difficult for people to recall than recognize as the short term memory of mankind is

quite limited. Therefore, the advantage of menu is that it does not require too much training and memory of answer options, thereby reducing the memory load of the user and making it easier for the user to learn. However, the disadvantage of menu is that too many options may result in longer operation time and thus become slower to skilled users [8] (Tseng, 2008).

Regarding the "setting system interface menu" for smart devices, due to increase in function, there are too many options to result in longer operational time. Therefore, it is not easy to use in operation due to the search for functions. The setting system interface menu is as shown in the following Figure 4.

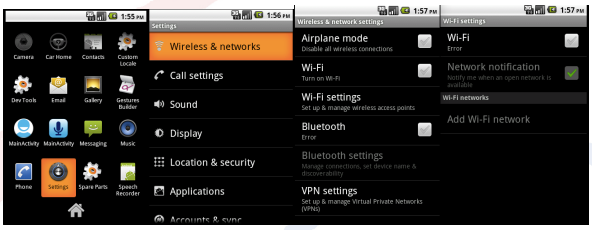

Figure 4 setting system interface menu

D. Case Study

This paper conducts the case study of Apple Siri and Google Voice Search in terms of function, interface and technology as shown in Table I.

TABLE I. **ANALYSIS OF APPLE SIRI AND GOOGLE VOICE SEARCH**

Application	Apple Siri	Google Voice Search
State of Use	online	online
Function	PDA (Remind the user of the desired information)	voice search (search for the user's desired information)
Technology	By the contextual dialogue control, the user is enabled to operate multiple applications by way of natural dialogue without operations according to the manual.	By Natural Language Processing (NLP) and question-answer dialogue system, the powerful search engine is transformed into an expert system to directly respond to the user's questions and needs.

III. USER INTERACTION DESIGN

The user cannot issue voice commands, this interface is not ideal on offline. The effectiveness of a proposed voice interaction mechanism. A yet no simplified the offline voice control interface design. Mainly for that system settings interface application is no longer single-use touch interface. Discrimination system for setting status through voice control, automatic switching action.

The following picture shows the identification return message (Fig 5), than whether its open the function, if so, the execution of its functions (Fig 6).

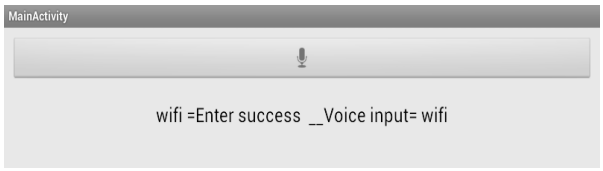

Fig 5 Display the comparison results

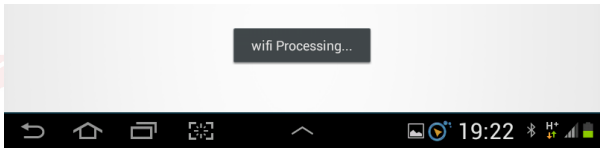

Fig 6 Implementation of Wi-Fi

Successful open Wi-Fi status display (Fig 7).

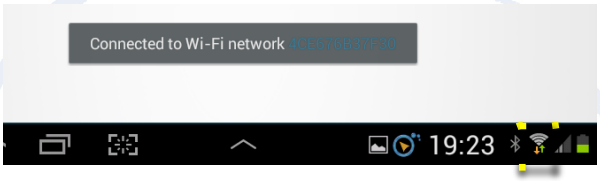

Fig 7 Turning Wi-Fi success

IV. CONCLUSION AND DISCUSSION

Voice control applications implemented in the operating mode, reached through voice control, a simple switch. Hope for the future can automatic switching on-line and off-line. Offline interface no of the simplifies operation. Online and offline can be done automatically detected Advanced system settings, complete voice input set, at this stage remains tactile interface. Advanced settings through voice control system is being developed

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Innovative use of Technology in Teacher Education Pedagogical Practices: The Effects of ICT-BASED Inquiry Approach on Pre-service Teachers' Achievement in the Inquiry Learning Process.

Sani Alhaji Garba, Termit Kaur Ranjit Singh, Najeemah Moh'd Yusof

Universiti Sains Malaysia, Malaysia

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Abstract

This is an intervention study that examines the effect of ICT-BASED inquiry pedagogy on pre-service teachers' achievement in technology, pedagogy and content knowledge; ICT literacy and competence; interest towards the use of ICT; and, achievement in the inquiry learning process. However, this article only reports the findings of the effect of the intervention (ICT integration) on pre-service teachers' achievement in the inquiry learning process. The study is a one factor three level quasi-experimental research with three different interventions (ICT integration) involving 192 pre-service teachers' (males and females) from four colleges of education in Nigeria. The participants were randomly assigned into three equal groups for the intervention. Both quantitative and qualitative data were collected for the study; the quantitative data were collected before and after the intervention. Analysis of covariance (ANCOVA) was used for the analysis; while for the qualitative data, content analysis was used. Findings from the study indicated significant differences between the groups [F(2,188)=11.960, P=.000, partial eta=.113]; and the marginal means plot shows that intervention 2 and 3 were more effective than intervention 1 compared with a mean score value of 44.524 and 44.400 (for groups 2 and 3) compared to 42.951 (for group 1). Analysis of the qualitative data in the study has shown that, innovative use of technology in inquiry-based teaching-learning approach improves pre-service teachers' understanding of inquiry learning process and improves their skills of inquiry, critical thinking and problem-solving skills associated with '21st Century Skills'.

Key Words: *ICT; Inquiry Approach; Teacher Education; and Pre-service Teachers'.*

Introduction

The teacher is a crucial factor in any educational system whose competence and efficiency has far reaching implications in the attainment of educational objectives and goals (Pelgrum 2001). Thus, the level of ICT literacy and competence of the teacher is crucial in determining the success of ICT integration in schools (Rosnaini & Mohd. Arif 2010). However, teachers' competence toward the use and application of ICT in their educational practices is dependent on teacher education and training on one hand; and, teacher educators on the other hand. Workshops and standalone courses on technology integration for in-service teachers may not be enough in ensuring effective use of technology in pedagogical practices (Mishra & Koehler 2006).

Preparing teachers to integrate ICT in their pedagogical practices need to be rooted deeply and effectively in the teacher education programme from the onset (Teo 2008); and teacher educators need to integrate and model the use of ICT in their pedagogical practices as well (Borlick, et. al. 2003). However, ensuring effective technology integration in teacher education would require a careful planning and transformational changes in curriculum content and pedagogical practices (Hammond & Munfra 2009) in addition to having access to ICT facilities. Even though technology integration in educational practices is much appreciated and considered a welcome development by most teacher educators (Baron & Goldman 1994; Ong 1999); it is yet to be fully integrated in teacher education curriculum and pedagogical practices in Nigeria (Onasanya, et. al. 2010). Most often, lack of theoretical and conceptual framework for technology integration in education and pedagogy has always been advanced as a reason for the low level of technology integration in teacher education and pedagogy (Misrah & Koehler 2006).

In this study, a framework for ICT integration in social studies teacher education curriculum and pedagogical practices was developed in line with the Technology, Pedagogy and Content Knowledge (TPACK *hereafter*) theory. The framework provide a guide for curriculum based technology integration for social studies teacher education; and, the integration of web-based technology resources, smart board and power point in the use of inquiry approach for citizenship instructions in social studies teacher education (ICT based inquiry approach for classroom instruction), in line with the Giving, Prompting and Making (GPM *hereafter*) model. The study tests the effectiveness of three different ICT intervention designs on the pre-service teachers' basic knowledge of the inquiry approach in social studies education.

Review of Literature

The need for ICT Integration in Teacher Education

Human involvement with computers and internet has made ICT an integral part of the human society. Preparing young citizens towards effective use of these technologies in society as future adult has been the concern of most educational system around the world (Greenhow, Robelia, & Hughes 2009). However, the success of every goal oriented innovation and transformational changes in the education industry for ICT integration in schools lies heavily on the school teachers' (Hammond et al. 2009). Therefore, preparing teachers to use technology in education has been the major challenge of educational administration in most countries. On the other hand, preparing new breed teachers to use ICT in their teaching has been the focus of teacher education training (Chai, Koh & Tsai 2010). Meeting up with these challenges

in the teacher education industry would require meaningful and well-directed ICT integration in teacher education curriculum and pedagogy for all disciplines (Gao, et al. 2009).

However, even though the need for ICT integration in teacher training and education is well established in literature (Chai, Koh & Tsai 2010); the present curriculum structure and pedagogical practices in teacher education and training does not adequately prepare the pre-service teachers for ICT integration (Kay 2006; Swain 2006). The pre-service teachers are not properly exposed to pedagogical use of ICT by the teacher educators (Brown & Warschauer 2006; Lim et al. 2010). Therefore, much is still needed in the development and application of frameworks, course designs and instructional models for subject disciplines in pre-service training (Haydn & Barton 2007; Lawless & Pellegrino 2007; Mishra, Koehler & Kerekuik 2009).

Pre-service teachers' are only exposed to one or two stand-alone ICT courses in most teacher education programme (Hsu & Sharma 2006) as the case is with Nigeria. The courses are basically taught for the development of ICT skills without being linked to any pedagogical design and subject content (Mishra, Koehler & Kerekuik 2009). This curricular arrangement and practice do not exposed the pre-service teachers to any adequate training on relating the ICT skills acquired to pedagogical designs and specific subject content (Lawless & Pellegrino 2007; Mishra, Koehler & Kerekuik 2009). The pre-service teachers are therefore left to wonder on their own regarding the syntheses of the three knowledge components for classroom application. This situation presents a reasonable research gap in teacher education curriculum and pedagogy (Angeli & Valanides 2005). Thus, studies are needed to bridge this gab in teacher education. New course designs, frameworks and instructional models for subject disciplines in teacher education need to be developed and tested on pre-service teachers' achievement and interest (Lisowski, Lisowski & Nicolia 2006). Such studies would provide lead ways for the needed changes in teacher education curriculum and practice that provide room for adequate training in the syntheses and application of these components in classroom teaching (Jonassen, et al. 2008; Mishra & Koehler 2006).

Most of the existing studies related to TPACK focuses on ICT course designs for teachers' professional development of ICT skills; and the effects of ICT skills on pre and serving teachers' (Chai, Koh & Tsai 2010). Such studies are built on the ground that proficiency in ICT skills is needed for teachers to effectively integrate ICT in their teaching (Littrell, Zagunmi & Zagunmi 2005). This is because teachers with high confidence level in their ICT skills tend to use ICT more in their instructional practices (Zhao, Pugh, Sheldon & Byers 2002). This notwithstanding, because practical application of ICT in classroom instructions requires a balance syntheses of utilising relevant ICT tools in teaching particular subject content using the appropriate pedagogy. This would in turn involve some changes in teacher education curriculum, pedagogical practices, and instructional designs for subject disciplines that need to be guided by theoretical frameworks, course designs and instructional models. Researches are therefore needed to guide the development of such frameworks, course designs and models; and, to test the effectiveness of such frameworks and models for ICT integration in teacher education for respective subject disciplines.

Methodology

This is a quasi-experimental study that investigates the effects of three intervention designs for ICT Integration in the use of inquiry approach for instructions in social studies teacher education. One hundred and ninety two (192) social studies pre-service teachers' were randomly selected to participate in the study. The sample population was made up of 101 males (52.6%) and 91 females (47.4%); 138 (71.9%) are within the age bracket of 18-24 years of age, 45 (23.4%) within the age group of 25-29 years of age while 9 participants (4.7%) are within the ages of 30 years and above.

Instrumentation

Both qualitative and quantitative instruments were used for data collection in this study; a questionnaire was adapted and used as instrument for the collection of quantitative data while observation rubrics was used for the qualitative data collected. The instrument (questionnaire) adapted from literature is titled 'Self-rated Knowledge of the inquiry approach in Social Studies Education (SRKIASSES)' has nine (9) items measuring one construct—knowledge of the inquiry approach. Table 1 below display the source where the items of the construct of the scale where sourced, selected and adapted for this study from literature.

Table 1

Sources of the Self-rated Basic ICT literacy and Competence Instrument

		SBKIASSE	
The Construct	**The scales**	**The theoretical base**	**Supporting literature**
Knowledge of the Inquiry Approach	Social Studies Inquiry-based Instruction Survey Scale; C.o.I Survey	CLT; Vygotsky Theory	Okam (1998); Okam & Bozimo (2000); Okam (2004); Albough, et. al., (2008); Swan et. al., (2008); Oliver (2007); Hsin-kai Wu & Chou-En Hsiech (2006); Spronken-Smith & Walker (2010).

Note:

CLT = Constructivist Learning Theory.

The construct and items that makes up the instrument were selected and adapted from the 'Social Studies Inquiry-based Instruction Survey'; the instrument was widely used for official and academic purposes by academics, the National educational Resource Centre and Social Studies Association of Nigeria (SOSAN) within the context of the Nigerian Society. The scale was developed on the basis of the constructivist learning approaches and theory (the philosophical base of Nigerian National Policy on Education Okam, 2002). Some of the literatures establishing the reliability of the scale are identified in table 1 above. Before adapting the nine items of the constructs, all the items earlier selected and considered for adapting were validated by experts for face and content validity; factor analysis was also performed to ensure that, all the items selected has meet up with the accepted eigenvalues benchmark. Nine items were

finally adapted to measure the construct based on experts' recommendations in the validation report and the result of the factor analysis. The reliability of the internal consistency of the nine items adapted was tested in the pilot study.

The instrument has only one construct with nine items. Thus, mean inter-item correlation coefficient reliability analysis was performed to test the internal consistency reliability of the instrument. Finding from the analysis indicated a Cronbach's Apha value of .779 and .785 (based on standardised items); suggesting that, the scale is reliable. The inter-item correlation value of the nine (9) items indicated in the inter-item correlation table ranges from .227 (item 3) to .491 (item 8). The corrected item total correlation value of the nine (9) items ranges from .354 (item 1) to .562 (item 5); indicating no item with a value that falls short of .3, therefore suggesting that all the nine items are measuring the same underlying construct. Based on this result and what was reported earlier in the literature identified in table 4.5 (B section), the internal consistency of the scale was considered reliable.

Observation rubrics was design for the inquiry facilitators (the teacher educators involved in this study) to assess the pre-service teachers' performance and skills in the inquiry learning process. The rubrics measure nine (factors) intrinsic in the inquiry-based teaching-learning process. Factor 1-8 has four rating scale represented by score that ranges from 46 to 100 while factor 9 has five (5) rating scale represented with scores ranging from 40 to 100. The nine factors assessed by the facilitators using the rubrics are shown in table 2 below.

Table 2

The Factors Measured by the Assessment Rubrics

S/No	Factors	Rating Scale	Grading
1	Understanding of the Inquiry-based Learning	1-4 (46-100 marks)	D-A
2	Skills of raising Research Questions and building the Inquiry Framework	1-4 (46-100 marks)	D-A
3	Skills of Literature Review	1-4 (46-100 marks)	D-A
4	Critical Thinking and Reasoning Skills	1-4 (46-100 marks)	D-A
5	Skills of Data Collection	1-4 (46-100 marks)	D-A
6	Skills of Data Analysis	1-4 (46-100 marks)	D-A
7	Collaboration and Participation	1-4 (46-100 marks)	D-A
8	Contribution to Group	1-4 (46-100 marks)	D-A
9	Final work done and presented	1-5 (40-100 marks)	E-A

The rubric was adapted based on Mullinix (2003) General Rubrics Grading Criteria and the work of Marzano, Debra Pickering and McTighe (1993) on 'Assessing Students' Outcome'.

The Quasi-experimental (Factorial) Design

This study is a one factor three level quasi-experiment that utilises the approaches of the pre-test—post-test design only as is presented in table 3 below.

Table 3
The Pre-test Post-test (Factorial) Design

The Factor	Levels	Sample size	The Dependent Variables
ICT Integration	X1	64	
	X2	64	Y1
	X3	64	

As shown in the table above, the focus of the study is on one factor that is ICT integration in teacher education curriculum and pedagogical practices. This factor in focus has three levels depicted as XI, X2, and X3 in the above table; the 3Xs means ICT Integration Treatment One, Treatment Two and Treatment Three respectively. Each treatment was meant to be applied to only one group; implying that, the factorial design has three treatment groups. On the other hand, the dependent variables is coded Y1 (Basic Knowledge of Inquiry). The effect of the three different treatments on the dependent variable was designed to be compared. By adopting the pre-test post-test design, it means that, the dependent variable is to be measured before and after the administration of the intervention.

The Intervention

In the design of this study, three sets of technology were used for classroom instruction using the inquiry approach as the treatment (the intervention) administered to the three research groups in four colleges of education. The first set of technology used is what Mishrah and Koehler (2006) described as 'standard technology' that is White Board, recorded audio tapes/cassette, and printed materials. The second set consist of Power Point, and web-based technology resources (search engines and free access web data base); while the third set is made up of Power Point, Smart Board and web-based technology resources.

These technologies were integrated into Social Studies Teacher Education teaching-learning process using the GPM instructional model that was developed in line with TPACK framework. The inquiry based teaching-learning process and the integration of the technologies identified in the teaching-learning process is guided by the principles underlying the application of the GPM model in social studies classroom instructions.

In treatment one, only the White Board, recorded audio tapes/cassettes and printed materials were used in the inquiry process using the GPM instructional model. The recorded audio tapes/cassettes and printed materials were integrated into the inquiry based teaching and learning process using the GPM model in teaching and learning Citizenship Education. Treatment two was the integration of Power Point and web-based technology resources in the inquiry-based teaching and learning process within the context of social studies teacher education. The third treatment was the integration

of Power Point, Smart Board and web-based technology resources in the teaching and learning of the integrated social studies teacher education curriculum using the inquiry-based approach. What differentiates the third treatment from the second treatment was the use application of Smart Board in the teaching learning process using the inquiry-based approach. Summary of the three treatments is shown in table 4 below.

Table 4
Summary of the Treatments

The Groups	**Group 1**	**Group 2**	**Group 3**
The Treatments	a. The integration of the White Board, recorded audio tapes/cassettes and Printed Materials; b. The teaching and learning of Citizenship Education; Methodology; and technology as separate curriculum components.	a. The integration of Power Point and web-based technology resources; b. The teaching and learning of the integrated social studies teacher education curriculum.	a) The integration of Power Point, Smart Board, and web-based technology resources; b) The teaching and learning of the integrated social studies teacher education curriculum.

As shown in the summary table, the integration of recorded audio tapes/cassettes, White Board and printed materials is in treatment one (X1); while the integration of Power Point and web-based technology resources is for the second treatment (X2). The integration of Smart Board in addition to Power Point and web-based technology resources is for the third treatment (X3).

Analysis and Findings

One-way between-groups analysis of covariance (ANCOVA) was used. Preliminary investigation was conducted to ensure that the assumptions for ANCOVA were not violated. The scatter plot was inspected to check for the assumption of linearity, straight lines suggesting linear relationship were indicated in the plot showing that the assumption for linearity was not violated; the assumption of homogeneity of regression slopes was checked statistically. The output generated indicates a sig. value of .713 (above .05—not significant) for the interaction level between the independent variable (the intervention—groups) and the covariate (the pre-test scores); suggesting that, the interaction level was statistically not significant. This result implies that the assumption of homogeneity of regression slopes was not violated. The Levene's Test of Equality of Error Variance indicates a sig. value of .087 (greater than .05—not

significant). Thus, suggesting that the assumption of equality of error variances was not violated. The result of the analysis of covariate (ANCOVA) performed is presented in table 4—the test of between subjects effects.

Table 4
The Test of Between Subjects Effects of the Overall Self-rated Basic Knowledge of the Inquiry Approach in Social Studies Education

Tests of Between-Subjects Effects
Dependent Variable: Post-test Overall Self-rated Basic Knowledge of Inquiry Approach in Social Studies Education 'b'

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	99.720[a]	3	33.240	8.116	.000	.115
Intercept	6689.190	1	6689.190	1633.318	.000	.897
OKIA 'a'	1.772	1	1.772	.433	.511	.002
Groups	97.964	2	48.982	11.960	.000	.113
Error	769.947	188	4.095			
Total	371878.000	192				
Corrected Total	869.667	191				

a. R Squared = .115 (Adjusted R Squared = .101)

The result of the one-way between-groups analysis of covariance (ANCOVA) presented above was conducted to test the effectiveness of three different interventions (ICT integration) on the overall self-rated knowledge of the inquiry approach in social studies education test. The independent variable was the three different types of interventions (ICT integration) given to groups 1; 2; and, 3 respectively, and the dependent variable was the post-test scores for overall self-rated knowledge of the inquiry approach in social studies education test administered after the intervention was completed. The pre-test scores of the participants were used as the covariate in this analysis. Preliminary checks were conducted to ensure that there was no violation of the assumptions for normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariate. After adjusting for pre-intervention (pre-test) scores, there was significant difference in the post-test scores between the three intervention groups on the overall self-rated knowledge of the inquiry approach in social studies education test [$F(2,188)=11.960$, $p=.000$, partial eta squared=.113].

The estimated marginal means table presented in table 5.22 show that, group 2 has the highest mean score value of 44.524 followed by group 3 with a mean score value of 44.400, while group 1 has the lowest mean score value of 42.951 in the post-test scores on overall self-rated knowledge of the inquiry approach in social studies education test, after removing the effect of the covariate (the pre-test scores). The

differences in the estimated marginal means between the groups implies that, intervention 2 and 3 were more effective that intervention 1 (compared).

The facilitators of the inquiry process (teacher educators) handling the groups involved in the study in all the four colleges of education where the study was conducted provide an assessment of the pre-services teachers' performance, acquisition and application of some skills related to inquiry-based learning during the intervention period. The assessment was based on individual pre-service teacher but the group as a whole. Each facilitator therefore assesses the group he/she facilitates during the study based on the assessment rubrics described in the method section.

The facilitators rating of the pre-service teachers' understanding of the inquiry-based teaching-learning approach in groups 1 ranges from 61 marks being the lowest (college 2) to 68 marks (college 4). All the four score values awarded are within the 'B—Grade'. Meaning that, the pre-service teachers in that group shows an average understanding of the inquiry-based learning process. The scores awarded to groups 2 on the other hand ranges from 73 (college 2) to 77 marks (college 3) while the scores awarded to groups 3 ranges from 74 (college 2) to 78marks (college 3). The two set of scores for the two groups (2 and 3) in all the colleges falls within the 'A—Grade'. Meaning that, the shows a good understanding of the inquiry-based learning process; and in the acquisition of related that includes: skills and competence of raising research questions and building inquiry frameworks; ability and competence in accessing, interpreting, evaluating and utilising information in establishing facts relevant to the issues under inquiry'; ability, skills and competence in identifying the importance and challenges of the inquiry in question; ability to translate and apply content knowledge into real life situation; skills of data exploration and collection in the inquiry process; skills of data analysis;

.

The facilitators rated the final work of groups 1 as 'C—Grade' with scores ranging from 51 (college 4) to 56 marks (college 2); groups 2 were rated with 'B—Grade' with scores that ranges from 62 (college 4) to 67 marks (college 1); groups 3 too were rated 'B—Grade' with scores ranging from 65 (college 3) to 68 marks (college 1). Indicating that 'work done and presented (by groups 1) was partially complete and has partially meets the expectations but not to the acceptable standard; the work shows inconsistency in demonstrating an understanding of the issues under inquiry and the inquiry learning process in general; average analysis; inconsistent use citation and from mixed quality sources; not much of technology was used'. However, the 'B—Grade' for groups 2 and 3 respectively implies that, 'work done and presented is complete and up to the expected standard; shows good understanding of the issues under inquiry and the inquiry learning in general; good analysis and presentation; relevant citations of facts for proves and evidence; and good use of technology'.

Discussion

Findings from this study has shown that, pre-service teachers' in groups 2 and 3 that were exposed to curriculum-based ICT integrated social studies teacher education curriculum using digital technology in the inquiry process, have higher self-rated knowledge of inquiry approach; compared to groups 1 that were exposed to learning technology, pedagogy and social studies education as separate curriculum domains using standard technology. Meaning that, curriculum-based ICT integration in social studies teacher education; and the integration of digital technology in social studies

teacher education pedagogical practices have a significant positive effect on pre-service teachers' knowledge of inquiry approach in social studies education. However, in addition to this, analysis of the teacher educators' assessment rubrics used in this study has shown that groups 2 and 3 have higher achievement in acquiring some skills intrinsic in social studies inquiry process than those in groups 1.

Based on this findings, it is evident that, curriculum-based ICT integration in social studies teacher education on one hand; and the integration of Power Point, Smart Board, web-based technological tools and data base resources in the use of inquiry approach for instructions in social studies teacher education can help pre-service teachers' to:

a. Have better understanding of inquiry-based teaching-learning approach for instructions in social studies education;
b. Acquire the skills and competence of raising inquiry research questions and building of inquiry frameworks;
c. Acquire the skills of data exploration and literature review;
d. Acquire the skills of critical thinking, problem-solving and decision-making which form part of life-long learning and 21st century skills.

Meaning that, ICT integration in social studies teacher education as designed in this study provides an effective approach that can facilitates the preparation of pre-service towards acquiring the knowledge, skills and competence needed to practice the use of inquiry approach and ICT in their pedagogical practices as teachers. These findings are similar to was reported as effects or benefits of ICT integration by other studies in Nigeria. Anyaogu (2012), similarly reported that the integration of ICT in pedagogical practices help to provide access to more wider sources of data, information (in form of video, audio and text) for data collection building knowledge through inquiry process compared to use of printed resources. It enhances inquiry attitudes and skills among learners as well as the inquiry process itself (Ezekola & Okoli, 2012; Obasi, 2008). It exposes learners to learning the process and skills of data collection, review and analysis (Obilor, Iheonunekwu & Ugbuta, 2012).

Recommendations and Conclusion

Based on the findings of this study, it is believed that the following recommendations would be useful in helping to prepare pre-service teachers' to integrate ICT in their pedagogical practices when in service.

1. Teacher educators need to improve on their pedagogical practices; model the use of ICT they teach in their pedagogical practices; and, shift away from lecture to activity oriented teaching-learning approach;
2. Pedagogical practices need to be re-directed toward the development of skills in addition to content knowledge;
2. In addition to teaching ICT as course (stand-lone) in teacher education, it should as well be embedded into the curriculum framework of respective disciplines.
3. Use of inquiry approach integrated with digital technology in teacher education pedagogy need to be emphasised so as to help learners acquire 21st century skills. This would assist pre-service teachers in acquiring the knowledge and skills needed to direct their pedagogical practices towards the development of 21st century skills using ICT and related pedagogical approaches.

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Employing POV Video to Develop Interactional Competence in Oral Communication Courses

Duane Kindt

Nagoya University of Foreign Studies, Japan

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Abstract

With the relatively recent development of lightweight and inexpensive point of view (POV) camcorders, naturalistic classroom events can now be captured from a truly participant perspective. Over the past two years, the presenter has conducted trials with a number of these head-held camcorders to examine the nature of interaction in freshman oral communication classes at a private Japanese university. One promising result of these trials is the use of POV video clips to create language-learning materials focused on the development of students' classroom interactional competence (CIC), particularly in collaborative dialogues (CDs). This report provides a brief description of the camcorders, their introduction to and use with students, and an example of POV-derived materials focused on communication strategies. The report concludes with the results of a question and answer session.
Note: This report recreates the actual presentation, based on video captured by a POV camcorder (Figure 1).

Figure 1: A still of the presentation from POV video

Introduction

"Welcome, everybody. It's nice to see a lot of interest in this topic, *Employing POV video to develop interactional competence in oral communication classes*. I do have a handout (see Appendix A) [that gives] you information about different sources and websites. It also has a transcript of one of the materials I made to help develop [students'] interactional competence (Appendix B). If there is anything that you'd like to know more about, my email [is on this handout] and you'll be able to contact me.

"I'm at Nagoya University of Foreign Studies. I've been there for 13 years. I've been teaching in Japan [24] years, and it seems like a very common problem to try to get students to exploit conversations in the classroom and improve their competence. I started using POV video to try to help [overcome that problem] in my classroom. So, POV [or] point of view camcorder—we have one of them on me now. If you look [at the] back [of the room] at Howard [Brown], he has kindly agreed to wear a POV camera. You can see it's also wired. He has a microphone and I have a microphone that is [transmitting] to the camera. So my voice and those around him and probably some across the way would be captured on the video."

POV camcorders

"Anyway, POV video has a [number] of different types and I [trialed several] of them because I was trying to find the [most effective] one. Contour®, Drift®—these are called *side-mount* cameras. The iPhone® and Hatcam® [combination] is useful because most students have a smartphone. But I think the best one [in my trials was the *center-mount*] GoPro® Hero 2® (Figure 2), which is what Howard is wearing right now.

Figure 1: The GoPro Hero 2

"Unfortunately, after extended wear it [can become] heavy, and so I had [hoped for] a lighter camera that didn't have the heavy, waterproof shroud on it. Last December the

GoPro Hero 3® (Figure 3) [was released]. The Hero 3 [is] lighter and also more powerful.

Figure 2: The GoPro Hero 3

"The advantage of POV camcorders might be obvious, but [there is] a kind of [subjective,] qualitative difference in the video. For example, the teacher traditionally might use a hand-held camera or a stationary camera on a tripod, and [from these objective perspectives,] this is what you would see (Figure 4).

Figure 3: View from the teacher

"Our understanding of the classroom is based upon what we see, [an observer's point of view], however, this is what the student sees, [a participant's point of view] (Figure 5).

Figure 4: View from a POV camcorder

"[To demonstrate this,] Figures 4 and 5 [were] taken at the exact same moment. [In Figure 5, I am] in the doorway taking this picture. [From my perspective, I was unaware that] a student was laughing. This [shows] that there's a lot going on that we don't see, and I think POV camcorders can help give us new insights into [what's actually happening] the classroom.

"[Here is a] summary of the [rest of the] presentation: I'm going to talk about the [GoPro] technical [specifications]. Those of you that use camcorders will be able to [evaluate] the level of quality of the camera. Then [I will explain] how I introduced the GoPro [to students, which is important] because we need to present it in a way that will [encourage them] to try it. Then I will give you an example of materials that I used to try to help develop interactional competence, potential benefits of POV recordings in general, [and finally] give you [the opportunity] to ask questions and give comments."

GoPro technical specifications

"So, the newest [POV camcorder], the Hero 3, costs about ¥22,000, roughly 200 American dollars. It weighs 75 grams, about half of the [Hero 2]. It has many recording modes, the best being 1440p. This "p" [stands for the number of] *points*, [indicating] a level of *high definition* (HD). It is [exceptionally] clear at 48 *frames per second* (fps). The *field of view* (FOV) is 170º, so the widest [setting] will easily capture the whole room. [It] also [has] 127º and 90º; I tend to rely on 127º. It's enough for what's going on in the classroom. A fully charged battery will last about 2 hours. The Hero 3 also has capability for a 64GB microSD card, which will give you 8 hours. Since [the release of] the Hero 2, we have an external microphone plug on the camera. The original Hero didn't have one, so the sound quality was [relatively poor. Currently, there is] an optional WiFi and a remote, so you can use your smartphone [to] see what students are seeing, and also start and stop their cameras."

Introducing the POV camcorder to students

"I introduced the GoPro to students in the summer of 2011. I [had seen] a video of my nephew. He's a motorcycle racer and he had a video where he's racing with the camera on his helmet and someone is also videoing him, and I could see the different perspectives. I thought, I [could] almost feel what it's like to ride that motorcycle. [Then I thought,] wouldn't it be interesting to see what students feel and see? I decided in the beginning of the second term, in 2011, to introduce this to students. I used a clip from the GoPro website (gopro.com) (Figure 6, GoPro images and trademarks used with permission).

Figure 5: Still from a GoPro® promotional video

"If you google "GoPro," you'll see a number of promotional videos that show extreme sports from different perspectives. I showed the students some bicycle jumping, and [after brainstorming some possible uses for the camcorder] I asked, 'Wouldn't it be great to try in class? It would be a chance for me to help you better because I could see what you are really seeing and saying.' Then I [showed students my GoPro,] put it on, and talked to them while it was recording.

"The next week, I reminded students why we wanted to use the camera. Then I asked for a volunteer because I wanted to capture them watching my clip. I showed my clip to the class while the volunteer was watching. I'll show you that clip [from the volunteer's perspective] now (Figure 7).

Figure 6: A volunteer wearing a GoPro watching a GoPro clip

[On the video, spoken to the students:] "'Do you remember last week, when I put the camera on? So this is just a video of you from me. So you'll be able to know what it's like to be 186 cms tall. And the view that I see of the class. So let's take a look at this short clip we took last week when I was wearing the camera.'

[On the video, from the original clip:] "'And now I'm recording you guys. And it's really neat because the view is so wide. Even if I'm looking over here [the left side of the class], you're still on camera [points to the right]. And if I look at something, it shows what I'm looking at [looks at the class handout]. And I was really impressed with the idea of camcorder in this classroom. Okay, I thought it would be really interesting for teachers to learn what students really see, what students really say. So I'm going to ask one of you every class to wear this camera. Isn't that cool?'

"Isn't that cool? Silence. So, I didn't want to come out right from the beginning and say, 'Any volunteer?' I wanted to wear it first and I wanted to show them the clip, and we got that captured by one of the students in the front."

Materials for increasing interactional competence

"[After several classes,] I started thinking about how we can exploit this video, what we are capturing. I probably made 24 or more lessons from different POV clips, but I decided to target classroom interactional competence (CIC) in collaborative dialogues (CDs). For those of you who aren't familiar with those, CIC is defined by Walsh (2011) following Kramsch (1986) as 'the ability to use interaction as a tool for mediating and assisting learning' (158). And CDs, based on mainly the work of Swain and others (Swain and Lapkin, 1995, Swain et al., 2011) is 'engag[ing] with others as a joint endeavor in meaning making' (34). So, [these are] conversations where students to work together to use different strategies to understand meaning, and share meaning.

"In one case, I captured students discussing *free time*. Then I looked over the POV clips, and I found a section that was about 2 to 3 minutes [long] that I thought had potential for teaching students to improve their CDs (Figure 8). I trimmed the section, saved to an .mov file, transcribed it, made a handout, underlined some interactional strategies, and noted the errors. In the next class, a week later, I told students, 'Okay,

we're going to watch it. Let's listen for strategies' and that's what I'd like [the audience] to do now. This is the clip of students talking about free time, what I thought was really [useful] for improving their ability to communicate during these dialogues. Let's watch (see Appendix B).

Figure 7: Still from POV video during a collaborative dialogue

"So [there is] a lot going on there. It may be hard to follow. In the handout on the back, there is a transcript of the main part there. I just wanted to note that after watching it and trying to think of the different strategies, I had students watch with this handout. You are probably wondering [whether or not] this is a bit much, but actually in the first semester we taught the majority of these strategies, showing ways for students to be more effective in their conversations, so it is a review.

"There were a few things that I was impressed by, especially Shota [all students' names are pseudonyms]. I mean, you could tell that Yuki is quite good. She is a returnee; she lived in Canada for a year. She's [assertive], and Shota was good-natured about it and took her advice. He [was also clarifying meaning when he] said, 'Do…do you know what I mean?' So he's using that language to try to be understood by her as well [as receiving her suggestions]. I thought that was a nice example. After [brainstorming] that list of possible strategies [on the handout], I did tell students to try to use them, encouraged them to use them, and I did hear instances of other students using different [strategies]."

Potential benefits

"So what are the benefits? Well, I think there is a lot of potential for using clips from POV cameras to improve students' interactional competence. I [plan] to carry this further in a more systematic study and try to see if there aren't ways we can better help students. I did notice students were affected very positively by it. I had them comment and one student wrote, 'It helps me to try harder because I feel like another teacher is watching me,' because they are being captured in the camera. Also [because of the] novelty, students will sometimes take off the camera and play with it, so it does add a kind of playfulness to the classroom. I can use clips for the same class or for other classes and, in fact, I did use [this clip] for other classes. I also noticed that with some students when I brought [clips] to them, they enjoyed seeing their own language and [appreciated the teacher's investment]. I think also, [there is] great

potential for teacher development. I teach an MA course for teachers, and I've suggested that they have a student wear [the camcorder]."

Question and answer session

"Okay, that's all I have. Like I mentioned before, I've been using these for a couple of years and [in many] different ways. But I want to hear your reactions, any questions, comments, or suggestions?"

Participant 1: I heard a lot of noise in the clip. Is there a problem with the microphone or wireless system?
"Yeah, it's when you hit [the microphone]. It'll crackle [if there is interference]. I'm looking for a better system because this [one uses] FM radio waves, not Bluetooth waves, so I'm looking for something [that provides better audio]. We want to be able to capture [both] the camera wearer and the partner clearly [but still providing freedom of movement], so we're looking for a solution to that."

Participant 2: We are considering cameras for teacher training. We are currently using handheld cameras but would the POV be better?
"Yeah, I think it's wonderful because [the students' or trainees'] hands are free. They can participate, so POV is an improvement [in] that way. With [some of] the footage I've captured, you just can't hear the partner well. The classroom is so noisy, but that is what we want. We want it to be in a naturalistic situation, so I think that will help once an audio solution can be found."

Participant 3: Have you had any problems with students wearing the GoPro because they are concerned about their appearance?
"Yes, I had one student use a mirror to get the camera on just perfectly, and it took 2 or 3 minutes and then finally he just took it off and said, 'No. It looks bad.' He wouldn't wear it. [Fortunately, his partner agreed to wear it.] As far as students in general, however, they seem to understand they will probably have to wear the camera at some point, so generally it's not a problem to get volunteers. [Some enthusiastic students even volunteered to wear it twice.]"

Participant 4: I think the best way not to look bad is to have the camera on your head.
Howard Brown: "It's working for me."
"Yes."

Participant 5: Have you ever had your students edit what they made?
"I haven't. I have a [Communication Studies] seminar [that could]. They were using the Hatcams, and we had the GoPro in the audience, and a stationary one. We had all this really rich video data, and we were thinking to start putting it together but [didn't have time]. That's a lot of work and it will take some thought to get it designed and [implemented]."

Participant 6: About how long can you record at one time?
"It depends on the size of your [memory] card. This one has a 32GB card so it will record for about 4 hours at your normal setting."

Participant 6: How much do you record at one time?

"I record the whole class [period, 90 minutes] because you can edit after. You can go back and pull out the clips that you want to use. And you never know when something [interesting or useful] is going to happen. I've considered passing it on to different students, but I just give it to one student to wear the whole time. [I think] that helps them to forget about it."

Participant 7: Do you think some teachers will hesitate to use POV cameras because they might be afraid of being recorded doing something "wrong," particularly in this day and age when things can be sent around the world and perhaps misconstrued?
"I haven't really been concerned with that because I'm in complete control of the use of the video. This one [Howard is wearing] isn't beaming anywhere. [Once recorded,] I take it and put it on my computer and [only] I have it to edit."

Participant 8: Do you get permission to use these clips beforehand?
"Absolutely. And if anything, I like to overdo [permissions]. I have a form that [students] can sign, and then, even in the last moment, [I tell them,] 'If you don't want me to use your clips to show the class, email me, or come to my office and tell me.' It happened one time. I had all the materials done and ready to go and I got [to school] in the morning and someone emailed me saying, 'Please don't show my video,' so I couldn't use it."

Participant 9: Have you ever had difficulties finding a volunteer?
"I've had a couple of classes, when I've asked for a volunteer, no one raised their hand, nobody volunteered, so I didn't [video that class]. The next [class meeting] I showed them a clip from another [group], with permission, and I [said, basically], look what you're missing. And then somebody raised their hand [to volunteer]."

Participant 10: Do you have any data to show that their competence actually increased?
"Not yet. That's coming next. I'm going to do a more systematic study. But there are so many angles to look at. The POV video gives us another tool, just like regular video [has become a common research tool]. Anyone could use POV for whatever they are looking at, in certain situations. I want to look at how we can get students to be better in their CDs, so that's what I plan to [focus] on in my research."

Participant 11: Thank you for sharing this information. I have a comment. We know that in SLA, motivation is a critical factor. I think students would be motivated by being able to see how they can use these conversation strategies effectively.
"Yes. I think the camera does that. I really think [students] are getting some kind of boost. You can see it in the videos. For example, Shota, in this video, not at the end but at the beginning of the course, he was quite shy and hesitant, and through this kind of strategy instruction, he did become more active. I was really impressed, that he was able to keep up with [other students] at the end of the course."

Moderator:
"Thank you for that very interesting presentation. Actually, I use one of them at home. I have a part-time hobby racing cars and we use one, mounted on the dashboard. So you can learn, if you spin or something, it will show you how to improve. But I never thought of using one in the classroom, so thank you for bringing—to me anyway—a great idea to use in the classroom."

Acknowledgement

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Appendix A

POV-related resources

Duane Kindt — Nagoya University of Foreign Studies
kindt@nufs.ac.jp

Popular POV camcorders

- Contour+ <contour.com>
- Drift HD <driftinnovation.com>
- iPod Touch/iPhone <www.apple.com> with Hatcam <www.hatcams.com>
- GoPro Hero 3 <gopro.com>

Online resource

Kindt, D. (2013). POV media in the classroom. Retrieved Apr. 21, 2013, from http://www.profkindt.com/site/POV_media.html

Related papers (available in PDF at the online resource above)

Kindt, D. (in press). Improving collaborative dialogues with POV video. In N. Sonda & A. Krause (Eds.), *JALT2012 Conference Proceedings*. Tokyo: JALT.

Kindt, D. (2012). A selection of point-of-view camcorders: Technical specifications, classroom trials, and potential applications. *Nagoya University of Foreign Studies Journal of the School of Contemporary International Studies*(8), 125~146.

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Appendix B

Excerpt from POV clip: Shota and Yuki are talking about *free time*

37. Shota: And I, how can I say <uses Japanese> the lyrics?
38. Yuki: Ah, okay, okay.
39. Shota: Yeah.
40. Yuki: It's, like, kind of singing…
41. Shota: Do you know wha, what I mean? checking partner's understanding
42. Yuki: What do you want to say? Just say it in Japanese. requesting Japanese
43. Shota: Ah, <uses Japanese>. using Japanese
44. Yuki: Ah, it is, like, humming. offering a translation
45. Shota: Humming?
46. Yuki: Humming. Humming. Hmm. I think that's what you mean.
47. Shota: Yeah. guessing what your partner means
48. Yuki: Humming.
49. Shota: Humming spell…? How do you spell that ? asking for spelling
50. Yuki: Uh, okay. I'll write it down. Uh, I think it's this. H-u-m-m… Yeah. Ca, do you have a dictionary? requesting a dictionary
51. Shota: Yeah.
52. Yuki: Oh, just, no, no, no. Use this one, use this one.
53. Shota: Okay. using a dictionary
54. Yuki: Thank you. How do you turn it on? Humming… Ah, wait. See? Hum.
55. Shota: Yeah. Yes, that's right. clarifying

Case Study of a Teachers' Professional Learning Community

Pai-Lu Wu*[1], Pi-Hsia Wang*[1], Ker-Wei Yu*[2], Yi-Xian Lin*[3], Pei-Chen Wu*[4]

*[1]Cheng-Shiu University, Taiwan, *[2]National Kaohsiung Marine University, Taiwan
*[3]National Tung-Kang Maritime and Fishery Vocational High School, Taiwan
*[4]University of South Florida, USA

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Abstract

The purpose of this study was to explore the operational effects of a teachers' professional learning community, using qualitative research methods such as teacher interviews, documentary analysis, and reflection paper analysis. The sample consisted of eight teachers at a marine technology school who were participating in professional learning community for teachers.

The results of this study indicated the following: 1. The intentions of both voluntary and involuntary members affected community progress. 2. Most community members were willing to follow the International Convention on Standards of Training, Certification, and Watch-keeping for Seafarers (STCW). 3. Community members were able to complete 16 instructional designs that incorporated new technology into project-based courses. 4. When community members utilized inquiry instruction, students provided the most positive feedback. 5. Although administrative departments worked hard to promote community operations, these processes were nonetheless negatively affected by inadequate communication.

In general, the quality of interactions among community members, particularly with regard to the communication of feedback, could be improved.

Keywords: *involuntary community members, marine technology school, professional learning community*

1. Introduction

This study grew from the need to examine recent trends in the development of marine technology that emphasize energy-saving methods and environmental conservation in terms of their significant influence on curriculum planning and instruction in marine technology schools. Training courses for electricians must abide by the International Convention on Standards of Training, Certification, and Watch-keeping for Seafarers (STCW). In 2017, new courses will be added for seafarers. Thus, marine technology schools in Taiwan need to follow international standards and provide training to new electricians so that they can participate in a skilled workforce that meets the qualifications set by international standards.

This study also addressed the rapid changes in technology and the challenges presented by future workplaces, especially with regard to needed modifications in academic curricula and requirements. As technology advances, schools will be required to incorporate these innovations into the project-based learning environments of vocational and high school courses to increase the international competitiveness of students. This is especially true for marine technology schools. As they face the need to develop new curricula, they will also need to establish professional learning communities for teachers that promote international perspectives and prepare students for certification.

The third goal of this study was to understand the process of community progress, to identify the possible challenges that may arise in this setting, and to seek effective problem-solving strategies and ways for improving community efficacy. This is important because teachers' professional learning communities are dynamic institutions dedicated to continuous progress via collaboration, sharing, discussion, and improvement of instructional methods. Community leaders must be willing to interact, share, and discuss topics with community members and, when necessary, address negative behaviors that may promote conflict, avoidance, and personal attacks.

The fourth goal of this study involved exploring the following questions: How do teachers participate in professional learning communities? How do personal views affect the participation and performance of teachers in communities? How does the instructional self-efficacy of teachers change? How does this affect the courses and instructional strategies related to new technology and what are the learning effects on students? How do involuntary members interact with professional learning communities?

These aims underlie the overall purpose of this study: to understand how teachers at Taiwanese marine technology schools participate in professional learning communities. To this end, we focused on the operational effects of five dimensions: shared leadership, shared values and visions, collective inquiry, shared teaching practices, and a supportive environment.

2. Literature review

2.1 The meaning of professional learning community

2.1.1 The origins and significance of teachers' professional learning communities

Teachers' professional learning communities, which are only about 20 years old, are part of an emerging educational trend focused on school reformation. The term "teachers' professional learning community" is derived from the field of anthropology, the context learning theory proposed by Lave and Wenger (1991), and the communities of practice theory developed by Wenger (1998). Sociologists have also proposed similar views, such as the learning community view suggested by Senge (2000). The concept of community was added later and applied to situational and organizational learning. Although academic concepts of "community" are, in general, similar to one another, different terms are used; these include "community of practice" (Wenger, 1998), "professional community" (Louis, Marks & Kruse, 1996), "professional learning community" (Hord, 2004), and "teacher community" (Grossman, Wineburg & Woolworth, 2001). This study emphasizes peer interactions among teachers in the context of a teaching environment. Thus, the term "teachers' professional learning community" is used.

The origin of teachers' professional learning communities can be traced to the 1980s and 1990s. At that time, the United States was promoting school reform but achieved poor results. Professional learning communities advocated for the active participation of its members in decision-making processes to improve their professional skills. Moreover, their belief that the motivation of a professional learning community to learn was important to the success or failure of school reform (Handy, 1995; Louis, Kruse, & Raywid, 1996) also contributed to the development of teachers' professional learning communities.

Teachers' professional learning communities have been defined in different ways. DuFour and Eaker (1998) defined a teachers' professional learning community as a group of educators who establish an environment that promotes mutual cooperation, emotional support, and personal development; in this environment, teachers can achieve objectives that could not be achieved individually.

Thus, a teachers' professional learning community is a group of professional educators dedicated to promoting pedagogical ideas and techniques by sharing, interacting, studying, and reflecting on the practice of education in a cooperative and emotionally supportive environment. Such communities respect the individuality of teachers by allowing for personal growth through a process of constructive and

innovative thinking and practice.

2.1.2 Characteristics (or dimensions) of teachers' professional learning communities

Scholars generally agree on the characteristics (or dimensions) of a teachers' professional learning community. Hord (1997) believed that teachers' professional learning communities provide a situational context in which the concept of dispersed leadership could be developed and maintained through the following: 1. a shared leadership structure that offers support, 2. a vision and set of values that emphasize sharing, 3. opportunities for collective learning and learning applications. 4. supportive situations; and 5. the sharing of personal instructional practices.

The Southwest Education Development Library (1997) in the United States summarized the relevant literature, noting that successful teachers' professional learning communities have the following five features: 1. a principal who invites teachers to participate in making decisions and shares power and authority with teachers; 2. a common vision developed jointly by the faculty and staff that includes a complete commitment to student learning and is expressed in the pedagogical efforts of these individuals; 3. collective learning by staff and faculty for the purpose of resolving the problems of students; 4. peer support for opportunities to observe and learn about the classroom teaching behaviors of colleagues, constructive feedback, and mutual assistance and support; and 5. cooperation among faculty and staff in the service of improving teaching skills (cited from McCollough, 2007: 47).

DuFour and Eaker (1998) believed that professional learning communities are characterized by the following six features: 1. the ability to share tasks, visions, and values; 2. collective inquiry designed to evaluate and significantly change the practice of instruction; 3. cooperative team-teaching and efforts to continue to improve the learning of students; 4. willingness to experiment and test hypotheses; 5. commitment to continuous improvement; and 6. emphasis on results and the use of data to make decisions about instruction and evaluation.

In summary, teachers' professional learning communities have the following traits: 1. shared leadership (including leaders who are supportive and open); 2. shared values and visions (including about tasks); 3. collective inquiry (including collective learning, group learning, and collaboration); 4. shared teaching practices (e.g., action- and/or experiment-based); and 5. a supportive environment (that encourages continuous improvement).

2.2 Effects of a professional learning community

Hunzicker (2011) believed that teachers' personal and professional needs (e.g., concerns and interests) should influence their professional development and that questions of what is being learned and how it is being learned should be emphasized in teacher education. He suggested that teachers use a checklist addressing five dimensions related to professional development and experience in other fields to evaluate themselves:

(1) **Supportive**: Are personal needs connected to school objectives?

(2) **Job-embedded**: Are teachers' efforts to improve themselves professionally integrated into their daily work? Do teachers continue to improve themselves and integrate such improvements into their teaching?

(3) **Instruction-focused**: Is improved student education emphasized?

(4) **Collaborative**: Are teachers working toward a common, consensually accepted objective?

(5) **Ongoing**: Are opportunities provided for teachers to test their ideas and methods or practice new techniques?

Lee, Zhang, and Yin (2011) studied 660 middle and elementary school teachers in Hong Kong to examine professional learning communities among teachers and associations between trust among faculty members, teachers' collective efficacy, and teachers' commitment to students. The scale assessing professional learning communities included three factors: shared and supportive leadership, collective learning and the application thereof, and supportive conditions–structures.

The study found that 1) the commitment (sense of mission) of teachers at different school levels to students was significantly positively correlated with the degree to which the professional learning community was characterized by collective learning and the application thereof, supportive conditions, trust among colleagues, and collective efficacy. However, shared and supportive leadership in the professional learning community could not predict the commitment (sense of mission) of teachers to students. 2) Support from professional learning communities, shared leadership, collective learning, supportive conditions, and trust among colleagues were associated with significant and positive improvements in the efficacy of the new or alternative instructional strategies emerging from such communities.

3. Research methodology

3.1 Research methodology: qualitative research

This study used data from in-depth interviews with members of a professional learning community, student feedback forms, teacher reflection reports, and classroom observations to gain a deeper understanding of the process and effect of implementing a "teachers' professional learning community for new technology" at a

marine technology school.

3.2 Research subjects

The sample consisted of eight male teachers at a marine technology school. Seven had master's degrees and abundant experience in instruction and administration; one had a bachelor's degree. The average duration of the teaching experience of community members was 13.6 years. The median age of research subjects was approximately 50 years.

3.3 Data analysis: qualitative analysis

Tapes of the qualitative interviews were transcribed for analysis and labeled to maintain the anonymity of respondents (i.e., T1-1-12 refers to the twelfth sentence spoken in the first interview of the first teacher). The interview guidelines served as the main framework for the data analysis, and content that conformed to the framework was identified and subjected to further organization, classification, comparison. Data with similar characteristics were then placed in the same core categories, which were used for the initial coding chart. These core categories evolved into the final framework as data from other subjects were coded.

The feedback forms from the study sessions and student projects were also labeled to protect anonymity (i.e., S1-35-1 refers the first feedback form completed by a student in class 1, which contained 35 students). Data from student feedback forms were analyzed to answer the research questions.

We used four indicators to evaluate the reliability and validity of the qualitative research: credibility, transferability, dependability, and confirmability.

4. Results

The results of the in-depth interviews and documentary analysis were used to determine how participating in a teachers' professional learning community affected its members. The results are presented below in terms of the characteristics of teachers' professional learning communities specified in Section 2.1 (shared leadership, shared values and vision, collective inquiry, shared teaching practices, and supportive environment).

4.1 Shared leadership

Data from in-depth interviews and documentary analysis revealed the following regarding "shared leadership":

Individuals lacked the willingness to serve as leaders, which reflected the ambiguity of this role and rendered the construction of community norms difficult. This resulted

in a lack of member identification with the group:

It's better to have a senior teacher as the leader; the leader should be a volunteer. (T1-1-16), (T2-1-19), (T3-1-28)

People differ with regard to their expectations, motivations, and willingness to participate in various activities at different stages of their career (Vermunt & Endegijk, 2011). Of the eight teachers, T2, T4, T6, and T7 were the most senior, having reached retirement age. They believed that it was best to maintain the status quo. Other teachers were not willing to lead due to health and family issues.

The teachers also had different beliefs about the mission of teaching. Some teachers, such as T1, T2, and T5, thought it was important to do their jobs well. Others, such as T3 and T8, felt a sense of responsibility toward the students. In the process of trying hard, they also actualized themselves.

I think if it is possible, we should provide more educational programs because students cannot wait and will eventually lose their motivation to study. (T3-1-13) (T8-1-57)

Moreover, it was difficult to arrange convenient meeting times due to teaching and administrative workloads, and participants were frequently too busy to attend**.**

These results show that the motivation and willingness to participate in shared leadership was affected by teachers' 1) lack of personal willingness to be leaders; 2) different career stages, which resulted in different priorities; (3) different philosophies about teaching; and (4) inability to meet due to work and personal obligations. Thus, even though the participants had the professional knowledge and ability necessary to develop new technology courses, they did not have a leader who was passionate enough to assume the responsibilities involved.

4.2 Shared values and visions

Marine technology teachers generally agreed that it was necessary to incorporate into courses measures of students' ability to serve as electricians and deal with issues related to green energy to satisfy international requirements. Their "reflection and feedback reports" included the following:

> I have to change my teaching method. Teachers need to design courses based on student needs so that students

> can explore and resolve problems in their own ways. (T1)

Because this was a new concept, T7 thought that maintaining the status quo was fine and was only minimally willing to participate. T5 believed that teachers should focus on maintaining their teaching skills and keeping their curricula current on their own before proceeding as a group.

> I think it is most important to try to improve our own teaching abilities. (T5-1-72)

Teachers responded differently to the establishment of a teachers' professional learning community for new technology. In theory, all teachers felt that it was necessary and very important. However, when the school administration advised them that a community would be established, T1, T4, and T6 felt that it was too sudden and that there was nothing that they could do about it. T4 clearly felt that the administration had shown a lack of respect for teachers and felt forced to participate under administrative orders.

With regard to the advantages of a professional community, teachers believed that it could increase the self-confidence of both teachers and students, achieve the required objectives, and foster self-actualization. However, the teachers were involuntary participants and strongly emphasized personal privacy and autonomy in their approach to teaching. Moreover, because the community had not developed clear "norms" to be followed by members, difficulties arose with regard to starting the community.

> The teachers' common visions should be shared along with personal expertise; it's not that easy to do research. (T2-1-9)

Even though all the teachers had expectations with regard to the quality of instruction, different educational philosophies produced different degrees of enthusiasm. For instance, subjects T1 and T2 had passive teaching styles and viewed instruction as work. T3 worked hard to teach students and emphasized the need for the further education of teachers. T4 believed that a teacher's role was to follow the curriculum of the course. T5 believed himself to be enthusiastic about his job. T8 had high demands for himself and hoped to provide students with exceptional instruction.

> Students have infinite possibilities, and I think there are some things that I can help them with. (T8-1-7)

Most members were willing to incorporate new technology and standards for electricians into the curricula as one objective of the community and understood the need for change. However, there was clearly room for improvement in the processes by which common values and visions were developed and members communicated and engaged in discussion. Most approved of establishing a teachers' professional learning community, and most thought that it would provide a personal sense of accomplishment and enhance the education of students. However, time and an insufficient understanding of community operations were major challenges that were reflected in the difficulty of starting the new group. Behind these challenges was insufficient motivation, compounded by a refusal to face change or do something new and unfamiliar. Bowing to the expectations and pressures associated with the role of teachers, members resigned themselves to accepting this responsibility even as they resisted it and exhibited passive resentment.

4.3 Collective inquiry

The in-depth interviews revealed the following.

Few teachers had an understanding of the process of collective inquiry. Of the eight members, T8 best understood the concept; this was followed by T1 and T5. The interpretations of these members reflected a sense of urgency about changing the current curricular content.

> Community might mean discussion and sharing, making greater changes to instruction, or departing from existing formulaic instructional methods. (T1-1-10), (T5-1-30)

The teacher participants were very concerned about "instructional autonomy" and did not want others to interfere with their methods of instruction; that is, such interference was perceived as an invasion of their privacy. Additionally, the time and format of the meetings led teachers to believe that they would be required to spend a great deal of time thinking about new instructional models. A leader was needed to create the necessary interactive atmosphere. Moreover, the concept of teacher autonomy was so deeply rooted that it was difficult for members to share and collaborate with one another.

Discussing and creating an instructional framework in the community may require time. (T3-1-53), (T7-1-35)

Lack of knowledge about the standards used by the STCW to assess the ability of electricians and their expertise with regard to green energy communities led to a lack of motivation to actively participate in the process of collective inquiry.

> Vessel electrical engineering and electrician courses are very complex, and it's not easy to do a good job. (T1-1-1), (T2-1-15), (T2-1-9)

The above belief suggests that teachers may have become accustomed to using the instructional materials provided by publishers. Additionally, their jobs were secure because of minimal competition for students in marine schools. The creation of new instructional materials via productive exchanges of ideas would have required more interaction and cooperation among participants.

4.4 Sharing instructional practices

The in-depth interviews showed that teachers emphasized instructional methods that catered to the individual differences among students. T5 was astonished by the infinite creativity of students, and T8 spoke about methods for guiding students as they learned about new technology.

> The creativity of students is difficult to imagine; they make really special things. (T5-1-25)

In their feedback forms, students S1-35, S1-04, and S1-06 showed that they searched for the root of a problem and then reviewed and tried different possible solutions in their individual learning processes. They were very motivated and produced significant accomplishments. For example, student S1-23 discovered the advantages of using solar-powered boats and improved a design to resolve a persistent problem. Students S1-22 and S-1-3 were motivated to learn after observational learning. Student S1-12-1 had a greater understanding of international trends. Teachers generally used guidance and encouragement to inspire students in their studies.

> I was very proud to receive the professor's approval at the results presentation today, and I hope next time I will do better than I have done in the past.(S1-35-2)

> I found that everyone had the same problem with the crooked keel, because…
>
> > I saw that all of the students were mobilized and seemed to have an objective, not because the teacher forced them but due to the power of the group. (S1-04-2)

The above statements show that the sharing of teaching practices was rewarding for students. The feedback forms and the projects undertaken by the students indicated that they were very proactive about learning more about their subjects. Indeed, the students' enthusiasm promoted a very positive learning environment, and everyone was inspired. Additionally, encouragement yielded great improvement in the study habits of students. More importantly, encouragement and accomplishments inspired students to explore new technology. This showed that all these paths can effectively enhance the motivation and interest of students.

4.5 Supportive environment

The school offered rewards for teacher participation and supported students in their learning of new technology by providing instruction and project materials. However, the teachers did not experience a strong sense of support.

> I suggest that it would be better to have an administrator with exclusive responsibility for preparing instructional and experimental materials. (T7-1-30), (T1-1-9)

This shows that although the administration had worked hard to create a supportive environment, communication with teachers seemed to be inadequate. Indeed, it is not enough to provide funding for materials or creating instructional frameworks. Teachers were also stressed and distracted by excessive teaching loads. Thus, decreasing the number of teaching hours and enhancing the social incentives, such by giving as awards or certificates of merit, may create the kind of supportive environment that teachers appreciate.

4.6 Development of a professional learning community

When most community participation is not voluntary, leaders need to provide clear explanations regarding the rights of and norms to be followed by members. These include basic rights, which should be explained before participants even enter the group, and rights enjoyed in the community, such the right to freely leave and reject unilateral and inappropriate decisions.

Data used in qualitative analyses and collected via a checklist developed by the researchers show that a professional learning community develops in the following stages. In the preparation stage, members are selected and informed of the rights and obligations associated with participation in the community and the purpose and proposed trajectory of the group. During the first stage, trust is established among members to create a safe atmosphere. The second stage, conflict and resistance, involves consolidating the group's motivation, resulting in the active implementation of community tasks. Thus, in the work stage, the third, members are able to focus on course development; in this case, the focus was on an electrician course that conformed to STCW standards. Finally, in the conclusion stage, the fourth, the resulting course, based on "scientific inquiry instruction," would rely on lectures, educational activities, instructional demonstrations, sharing, and feedback. Use of a process such as this enables both students and teachers to feel encouraged to improve their skills and abilities and to experience a sense of accomplishment. However, care must be taken to ensure that the teachers (members) have time for professional self-development and development of future goals.

5. Summary, conclusions, and suggestions

5.1 Summary

This study examined a teachers' professional learning community in terms of five dimensions: shared leadership, shared values and visions, collective inquiry, shared teaching practice, and supportive environment. This approach differs slightly from the Professional Learning Communities Assessment (PLCA) developed by Lee, Zhang, and Yin (2011), which includes three factors: shared and supportive leadership, collective learning and application, and supportive conditions–structures. The five dimension of the teachers' professional learning community is similar with Hipp and Huffman's (2004) suggestion. However this study focused on vocational school teachers at a marine technology school. In this case, the professional learning community, consisting of eight teachers at the school, was established to meet the urgent need to teach the new technology required for certification. The analytic process adopted in this study was unique and instructive in that it relied on a checklist of tasks that needed to be completed to achieve community objectives.

Voluntary and involuntary members: Many studies agree that teachers' professional learning communities can enhance individual and collective instructional efficacy. The most important benefit is that leaders can create a supportive, sharing, and collaborative team environment (Lee, Zhang & Yin, 2011). In this study, most members just get the job done of insufficient motivation and discussion. These reactions significantly limit the ability of teachers to benefit professionally form

collaborative teamwork. Because as Dooner, Mandzud and Clifton (2008) suggested a means-convergence model, tension and conflict is inherently embedded in the collaborative process. However, most of the participants in this study were involuntary community members who were either not interested in or not able to fill the leadership role but hoped, instead, for an administrative director to assume that position. This study also found that many community members were unwilling to participate in either the creation or the operation of the community. Indeed, attendance rates were low. Despite the establishment of common times for meetings, teachers would often have to leave due to other responsibilities, including teaching. Some members were unwilling to learn new technology. Thus, an important contributor to the success of a community is the ability to recruit willing participants.

> I think that if there were more communication or negotiation rather than mandates or assignments it would be better; or maybe there is no need to communicate. (T4-1-12)

> I am very stressed, but what can I do?! (Said in a somewhat helpless tone.) (T1-1-7), (T4-1-44), (T-6-17)

> Because most of the teachers have not guided students in practical projects, we have different ideas about the skills necessary for electrician courses. (T5-1-92)

Teachers' sense of mission with regard to instruction and their beliefs about personal career planning: The eight teachers in this study were at two ends of the age spectrum. One group was about to retire or was approaching retirement; the latter were gradually reducing their administrative duties. This group preferred to maintain the status quo due to the time and effort they had already given to the educational system as well as their desire to preserve their classroom time.

The other group consisted of new teachers, who had a sense of mission with regard to the students. They were more willing to try and accept challenges or become leaders in efforts to realize students' potential. These characteristics influenced how proactive they were in the community.

The process of community-building begins before the preparation stage: Research shows that closed groups are best and that allowing members to freely join and leave interferes with group cohesion (Corey, 2001). Studies have found that

community development requires establishing and developing community norms (Van Es, 2012). Because teachers' feelings and beliefs about establishing a teachers' professional learning community vary, some teachers may be more concerned than others about not being chosen or not being respected. Because these communities emphasize non-administrative leadership, information about community objectives should be provided and direct communication should be established before the community begins its work.

However, the community examined in this study lacked sufficient communication and preparation to fulfill its duties. This was due to insufficient motivation, compounded by a refusal to change and do something new and unfamiliar. Although they attempted to appear to participate in the community, many members remained resistant to participation and exhibited passive resentment. This behavior was attributed to the pressures and expectations of the teacher role.

Shared values and visions: In-depth interviews indicated that some members felt that it was necessary to incorporate measures of electrician ability and expertise in green energy into coursework, but most were interested in developing international connections. No consensus was reached with regard to other areas. However, the interview process revealed that it was difficult to achieve common values and visions in a short period of time in the absence of an effective community leader.

The norm of teacher autonomy: Community members were generally able to design instructional material incorporating measures of electrician ability and expertise in green technology. However, this process revealed the longstanding image that teachers have of themselves as autonomous and independent individuals. Indeed, teachers preferred designing instructional activities alone in the absence of input from others to ensure their individual freedom. This norm is similar to the phenomenon frequently seen in foreign studies about teacher communities that report that concerns about autonomy and privacy frequently interfere with collaboration among community members and cause conflict when a community moves toward the same objective (Levine, 2010).

Similar to the results of the study conducted by Grossman, Wineburg, and Woolworth (2001), we observed a clear change in attitude when community members (teachers) shared ideas regarding instruction in new technologies, helped students with their projects, and focused on leading the exploratory learning of students. Sharing and reflecting with one another can be quite effective in promulgating new methods of

instruction related to new technology. Moreover, members can learn from one another about creating a friendly learning atmosphere and can share techniques for guiding students as they learn about new technology. Most teachers emphasized individual differences among students and provided them with guidance and encouragement. From this study, students learn and reflect more effectively when taught by teachers with this philosophy. Most importantly, students need to be encouraged and feel a sense of accomplishment in the educational process to be strongly motivated to explore new technology.

> T3's comments about S1-23: "You have good ideas, and you should try to realize them."
>
> T5's comments about S-2-15-3: "After a few tries, I think you will have an excellent understanding of ship models. Keep up the good work!"

Supportive environment: Are the teachers' personal needs connected to the school's objectives? Is communication between teachers and administrators clear? Can teachers choose the type of support they want? How can teachers and students be motivated to actively participate? These are all important questions that deserve consideration. Additionally, administrators should emphasize communication and coordination with teachers. Since there are only eight people in the community, using administrative-level conveyance methods may result in poor communication and misunderstanding or unnecessary delays. Direct communication should be considered in the future. Similar to the findings reported by Lee, Zhang, and Yin (2011), our results show that shared and supportive leadership, collective learning and application, supportive conditions, and trust within a teachers' professional learning community can significantly and positively affect the collective efficacy of teachers' instructional strategies.

5.2 Conclusion

1. Shared leadership: Community members can provide supportive and shared professional leadership, but involuntary members need more information, respect, and understanding about their individual value systems.
2. Shared values and visions: A vision should be established for the new technology and its connection to international indicators. Community norms should be formed via collaborative discussions and then followed by the community. The resulting increase in dialogue among members should be encouraged.
3. Collective inquiry: The concept of "instructional autonomy" means that community

members incorporate measures of electrician ability and expertise in green technology into the design of the instructional material used in their respective courses. However, this process can be marred by insufficient interaction and too few exchanges of ideas. The process by which instructional material is created should involve intra-group cooperation, discussion, and sharing.

4. Shared teaching practices: The quality of interactions among community members and of participation in the sharing of ideas is related to how lessons are taught and reviewed as well as to the feedback provided by students. Teachers who receive approval for the application of new techniques learned from other members will be motivated to enhance their participation in those processes in which instructional practices are shared.

5. Supportive environment: We found sufficient administrative support, instructional material, and funding, but insufficient communication between the two groups. In the future, the administration should consider measures that satisfy teacher needs.

6. The process by which a professional learning community is created can be described in terms of preparation followed by four stages: relationship establishment, conflict and resistance, work, and conclusion.

5.3 Suggestions

Based on these conclusions, we offer the following suggestions:

(1) Motivate teachers to participate in teachers' professional learning communities.

Methods may include the following:

1. Select members who are willing to voluntarily participate in communities. The motivation and level of participation of voluntary and involuntary members differ.
2. Before organizing the community, establish adequate communication between the administration and the teachers. Direct communication is recommended for explaining the rights, obligations, and norms that should be followed by community participants.
3. Teachers should have a given time allotted for community meetings so that they do not have to leave early to teach a class or fulfill another school-related responsibility. The school can arrange this in advance to facilitate community activities.
4. Organize lectures on themes related to teachers' professional communities to enhance teachers' understanding of communities.
5. Provide incentives for participation, such as increased scores or points on teacher evaluations, reduced teaching hours, and/or bonuses.

(2) Provide leadership training for the leaders of teachers' professional learning communities.

Training sessions should accomplish the following:

1. Provide more opportunities for teachers willing to be leaders to engage in study and training related to leading communities,
2. Organize sharing sessions in which leaders share professional knowledge.
3. Reward and assist teachers who serve as leaders with regard to scheduling classes.

(3) Enhance the process by which the professional learning community operates.

This can be accomplished in the following ways:

1. Consolidate the visions and enhance the consensus of the community through brainstorming and discussion.
2. Discuss the expectations of the community and establish the norms that need to be followed by community members (e.g., participation, punctuality, timely completion of work, and sharing).
3. Inquiry instruction: Hold symposia on writing instructional materials to improve members' abilities in this domain.
4. Provide training to teachers on the new STCW indicators of electrician ability and expertise in green energy communities so that they can improve their ability to create instructional materials and provide instruction in these areas.
5. Observational learning: Provide opportunities to observe how other schools have incorporated new technologies into specialized instructional modules.
6. Provide a warm, accepting, and safe atmosphere for sharing.

(4) Improve education techniques.

Relevant methods may include the following:
1. Provide and increase the interscholastic opportunities for project observation and self-motivation.
2. Arrange symposia that promote a cooperative atmosphere and draw on the latest scientific learning methods.
3. Increase the number of opportunities for reviewing high-quality instructional materials and methods and informative case studies.
4. Establish personalized pedagogical approaches to the presentation of case reports and relevant material and encourage engagement in scientific inquiry.

(5) Suggestions for the administration:

1. Increase intrinsic and extrinsic motivation to learn (e.g., establish an awards system based on evaluations of community activities).
2. Offer administrative assistance by providing an administrator whose sole responsibility is meeting preparation and procurement of instructional and experimental materials.
3. Reward outstanding projects, student work, and/or teacher reflection reports.
4. Encourage participation in international competitions. Increase the self-confidence and professional expertise of teachers and students so that they can interact as equals with their colleagues throughout the world.

(6) Suggestions for future research:

Future research should further explore the pedagogical and interpersonal processes that contribute to the teaching of new technology skills. Analysis of videos of community processes and completion of checklists to identify the most important features of interactions among members may be helpful approaches to assessing and improving the quality of community dynamics.

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A Future Classroom Combined with Technology and Art for Efficient Innovative Learning

*[1]Weixun Cao, *[2]Liya Hua, *[3]Yuping Sang, *[4]Yingping Chen, *[1]Zhiqiang Xu
*[1]Yan Huang, *[1]Xue Li

*[1]Arixin Electronics Co., China, *[2]Jiangnan Middle School, China
*[3]Jiangsu Xishan Experimental High School, China, *[4]Nanhu Primary School, China,

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Abstract

A highly-efficient innovative classroom, called "Bit Laboratory", that combines the application of electrical sensors and a new type of 3D art design together for fast prototyping is presented. In order to inspire the students' spirit of innovation, everything in this classroom is designed and built by small "Bit". The chairs and desks are made from transparent bricks that the students can assemble by themselves. Electronic sensor-based "BitLab Bricks" enable the students to conceive a conceptual idea to house the electronic components using eight transparent geometric shapes in different colors. The interactive learning platform is delivered through team-based "BitLab Curriculum", which consists of four components: (1) The Inventor's Story, (2) To Be a Good Engineer, (3) To Be a Creative Artist and (4) To Be an Enthusiastic Speaker. Each team consists of three to four students of various abilities and both genders. During each project, the team members work together and resolve conflicting ideas in order to reach a consensus on their design. Team members of varying talents shine throughout the process.

"Bit Laboratory" integrates scientific history, sensor technology with quick prototyping and public speaking in a team-based interactive learning environment. The "Bit Laboratory" has sprouted all around China in schools and tech museums. The status and impact of "Bit Laboratories" in elementary and middle schools are presented.

Keywords: *Classroom teaching; Engineering Education; STEM; Public Speaking; Innovation*

I. Introduction

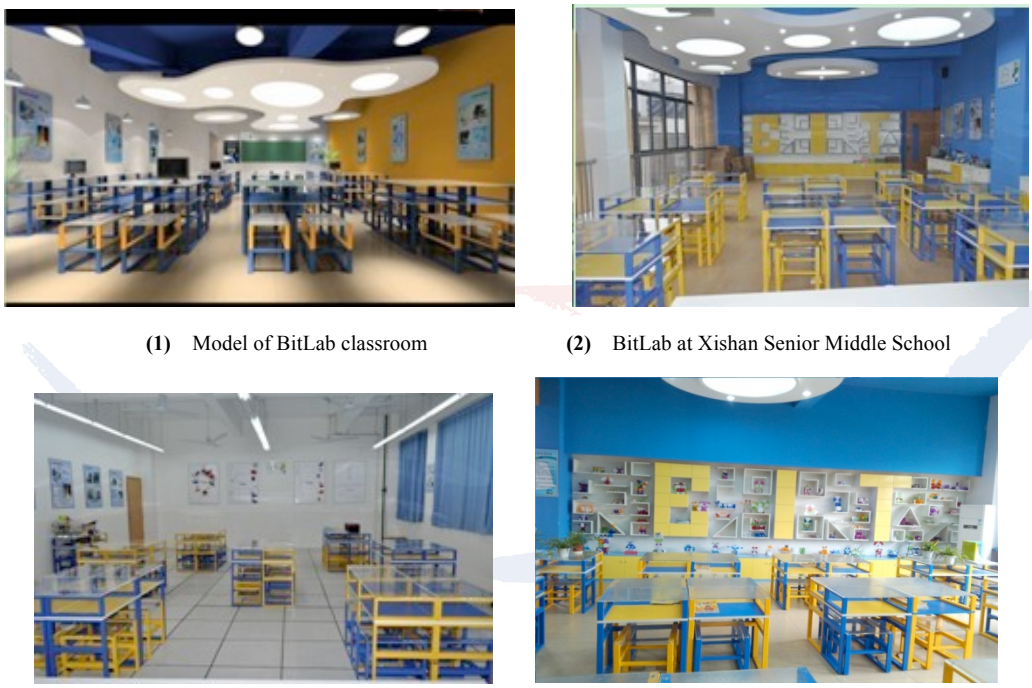
The 21st Century is a digital age with fast growing information and technology. Traditional teaching method is facing challenges in order to meet the demands of modern education. Students need to gain the power of creativity, innovation, team work and other important skill, such as dealing with a large amount of information and the capability of self-learning and problem solving [1].

In this paper, we present a future classroom called "Bit Laboratory", which integrates scientific history, sensor technology with quick prototyping and public speaking in a team-based interactive learning environment.

II. The Classroom of BitLab

- **A Classroom for imagination and creative thinking**

In the form of hands-on interactive teaching. BitLab adopts advanced sensor and electronic technologies, and also creative imagination and cultivating model. It closely and naturally associates science with art to enhance children's intuitive sense to learn on their own, and their capabilities for doing-it-yourself ("DIY"). BitLab teaches observation, contemplation and problem solving by applying knowledge while experimenting with "what if?" scenarios. Figure 1 shows pictures of BitLab classrooms at different schools.



(1) Model of BitLab classroom **(2)** BitLab at Xishan Senior Middle School

(3) BitLab at Jiangnan Middle School **(4)** BitLab at Nanhu Primary School

Figure 1: The pictures of BitLab classrooms: (1) Design model, (2) at Xishan Senior Middle School (3) at Jiangnan Middle School (4) at Nanhu Primary School

Bitlab, through its unique interactive teaching and brainstorming atmosphere, helps students to discover their own innate abilities to envision and to invent.

- **Self-assembled sensor-equipped chairs and desks with transparent desk surface for portable computer usage**

The desks and chairs in Chinese classrooms are individual-based units. It is not suitable for team-work activities. It is difficult to repair as the entire desk or chair is one piece and cannot be dissembled. In BitLab the desks and chairs are built using same-sized building blocks. The frames of desks and chairs are made of iron or wood, as shown in Figure 2. The desktop is made of transparent acrylic material. Students can put textbooks and tablet PC under the transparent surface while performing experiments and brainstorming experiments on the desktop. Students can assemble their own tables and chairs for different teamwork requirement.

Figure 2: The desks and chairs with transparent desk surface in BitLab classrooms

- **Experiment kits for sensor-based electronic bricks with real-life applications**

The electronic bricks contain different sensors, such as light sensor, sound sensor, ultrasonic sensor, motion detector, temperature sensor and many other actuator types. These electronic bricks can be connected together, using a common interface connection, to build real-life applications, such as a sound-activated light or a smoke detector. In BitLab, just by connecting electronic bricks together with standard wires and connectors, one can easily build a home safety monitoring system controlled by mobile phones. Such activities motivate students because school closely couples to real life. A sensor-based infrared-activated voice recorder system, just one of BitLab's entrepreneurial educational kits is, shown in Figure 3.

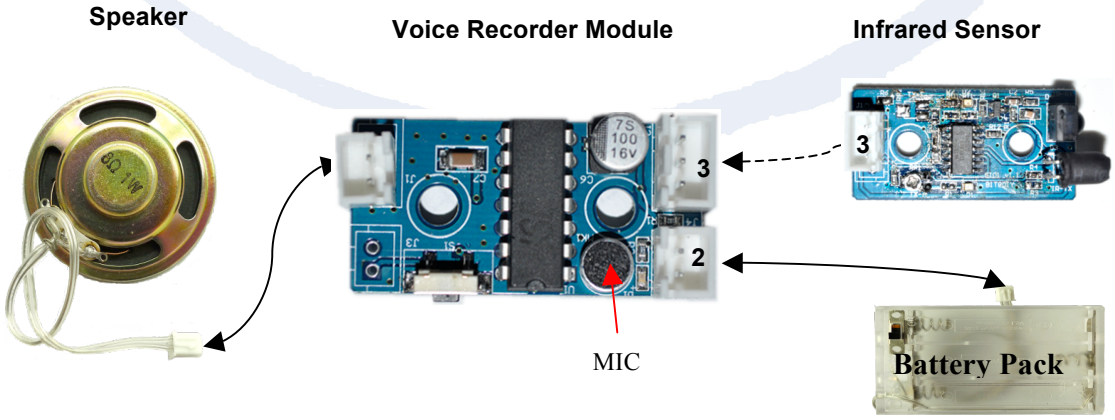


Figure 3: An infrared activated voice recorder with infrared sensor module, voice recorder module, speaker and batter pack.

By using BitLab's electronic bricks, the time and effort needed to build real-life applications is greatly reduced. With different combinations of these electronic modules, students can quickly build electronic prototypes for real-life applications. It also enhances the students' interest in the design of electronic systems, and stimulates students' creative thinking and hands-on practice.

- **Eight transparent geometric shapes of different colors to build 3-D models**

To enable rapid prototyping of students' creative designs, eight basic geometric shapes are used. Students mount the electronic bricks to the geometric shapes; some student designs resemble a house, a car or any form from the students' imagination. These eight basic geometric shapes consist of square, rectangle, circle, triangle, quarter circle, small right angle, small rectangle and small obtuse angle, as shown in Figure 4. These bricks are made from colorful acrylic material. Uniquely designed push-pull rivets and plastic screws and nuts are used to connect acrylic plates into 3-D models. It enables students to conceive a conceptual idea to house the electronic components using eight transparent geometric shapes in different colors.

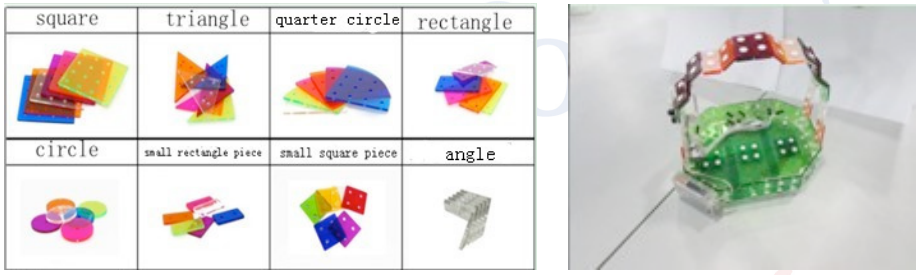


Figure 4: 3D building blocks and an infrared sensor activated fruit basket made from 3D building blocks

III. Interactive Learning Platform

The interactive learning platform is delivered through team-based "BitLab Curricula", which consists of four components: (1) The Inventor's Story, (2) To Be a Good Engineer, (3) To Be a Creative Artist, and (4) To Be an Enthusiastic Speaker. Each team consists of three to four students of various abilities and both genders. During each project, team members work together and resolve conflicting ideas in order to reach a consensus on their design. Team members of varying talents shine throughout the process.

Figure 5: Learning inventors' story

(1) The Inventor's Story. In order to students' spirit of curiosity and exploration, great inventor's stories, such as Edison's invention of the electric lamp, are told by the teachers or students during a BitLab's class. Figure 5 shows the students at Nanhu Primary School listening to inventors' story during BitLab's class.

(2) To Be a Good Engineer. The second part of a BitLab class is to teach students how to effectively use the sensor-based electronic bricks to solve a real life problem. These sensor-based electronic bricks consist of different kinds of sensors, such as sound, light, temperature, ultrasonic, electromagnetic wave, infrared and many others. One such student team is shown conducting an experiment at BitLab in Figure 6.

Figure 6: Experiment with sensor-based electronic bricks at BitLab

(3) To Be a Creative Artist. Having debated and conceived their product idea, then in the third part of a BitLab class, students construct the housing for electronic components using eight transparent geometric shapes, which come in different colors. The third part of a BitLab class is to let students to house the electronic components using eight transparent geometric shapes in different colors after conceiving a conceptual idea. Figure 9 shows one result of a student's design called "CF Gemini Housing Building" at Xishan Senior Middle School.

Figure 7: Artist design of a CF Gemini Housing Building

(4) To Be an Enthusiastic Speaker. After completing the prototype, each team will write up a description of their prototype and give a presentation on its features and functionalities, marketability, cost and profit expectations, and other business, environmental, and social considerations. Such teaches students confidence, practical assertiveness, and presentation skills in front of other people. Figure 8 shows the picture of one such student presentation at BitLab.

Figure 8: A student presentation about their prototype and design ideas at BitLab

IV. Conclusion

In this paper we have shown and described a new classroom, called "BitLab", and learning philosophy designed to prepare today's children to imagine, to set goals and teams to innovate solutions for the real-world, to compete in the market of ideas, and to do so efficiently. BitLab integrates scientific history, sensor technology with rapid prototyping and public speaking in a team-based interactive learning environment. The interactive learning platform is delivered through team-based "BitLab Curricula", which consists of four components: (1) The Inventor's Story, (2) To Be a Good Engineer, (3) To Be a Creative Artist, and (4) To Be an Enthusiastic Speaker.

BitLab is already making a great impact on education in China. For instance, thirty (30) BitLabs have been built since 2009, to include 13 primary schools, 12 secondary schools, 3 technology museums, and 2 public youth centers. However, we still face difficulties to deploying BitLab, as most of the Chinese parents and students think that the college entrance examination is the only way to success. Further work is needed to establish a BitLab evaluation standard.

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Profile Based Electronic Learning Content Aggregation and Delivery System Using Self Learning Satisfaction Index of User as Feedback

Nitin Pujari, Vinay S K, Sucharitha Prabhakar

PES Institute of Technology, India

0403

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Abstract

Every human entity born in the universe, will possess distinct characteristics, some inherited, other their own. Human beings when compared mainly differ in their biological, chemical and psychological characteristics. These differences make human beings to receive, perceive, interpret and store information differently based on their cognitive abilities. This proposes a challenge for the design of traditional and/or electronic teaching learning systems to cater to the diversified needs of the learner. In traditional learning systems, the challenge is on the tutors to identify learning abilities of the pupils and teach accordingly. To some extent this has been achieved by good tutors, which most of the time is not a scalable proposition. The advent of electronic learning systems has been able to successfully achieve the scalability aspect of this ecosystem. The current electronic learning systems to greater extent do not take into account the learning ability or comprehension index of the learner. This work attempts to propose a concept, model and/or mechanism for electronic learning systems to aggregate and deliver the content to the learner based on the profile of the user which include comprehension index of the learner. This is achieved by utilizing self learning satisfaction index of the learner as feedback.

Keywords: *social networks, context, congruence, congruent network, homogeneous, heterogeneous*

I. Introduction

Knowledge resources generally are not organized based on the cognitive abilities of an individual. Individuals with lesser cognitive abilities will find it difficult to understand the contents presented in the knowledge resources which have higher comprehensibility. On the other hand, people with a higher cognitive ability will not find a knowledge resource with lesser comprehensibility useful. The content presented in the knowledge resources are expressed from the perspective of conveying the concept assuming certain pre-requisites which sometimes masks the cognitive abilities of the learner. It is obvious that the learners have different cognitive abilities and therefore there is a need to identify learning abilities of the learner and present the content in which he/she would feel congruent or appropriate. Learning abilities include the ability to understand, familiarity with the concept and prerequisite knowledge. To make learning process productive, this work proposes a concept, model and/or mechanism called "Profile based electronic learning content aggregation and delivery system using self learning satisfaction index of user as feedback" which takes into account the learning abilities and presents the appropriate content. The proposed concept and model can be implemented in three steps:

1) Self-Assessment

2) Knowledge Progression

3) Assimilate New Concepts

1) Self assessment: Learner is expected to have some understanding of the domain/sub-domain during self assessment. The proposed system encourages different approaches for automating the generation of a question bank based on the ability of the user. This can be achieved by analyzing the quality of basic knowledge that he/she posses represented by a paragraph. The learner evaluates and gauges the level of knowledge and gives feedback to the system for the next step of actions.

2) Knowledge Progression: Learner assesses his conceptual knowledge from step 1. Based on the assessment, learner can deduce the self learning satisfaction index. If self learning satisfaction index is high, learner can concentrate on a different concept, or else can decide to increase his expertise in the chosen concept after comparing with the performance index generated by the system.

3) Assimilate New Concepts: The learner can assimilate new concepts in a chosen domain. In this case, learner selects the concept in which learner is a naive. The proposed system treats the learner as a beginner. Initially an introduction to the concept is presented. The learner attempts to understand the concept. On success learner can proceed with knowledge progression or else the system will suggest pre-requisite concepts. Learner can proceed with the knowledge progression or assimilation of the pre-requisite concepts.

The system we are proposing uses profile as the basis for content selection and assessment. All the result of activities with our system such as feedback will be recorded in the profile.

Profile of a user can be defined as the information of the user which will help us in fine tuning the content for learning. Profile can also be treated as a tool for personalized learning for each user. In our proposed system, the profile of a user is

not constant / not fixed. For every learning process, a profile is necessary. The profile must consist of a specification of information related to the domain and subject.

The proposed profile based system differs from the other existing systems, in such a way that our system takes into consideration, multiple profiles for each user one profile for each learning of new domain.

II. Architecture and Overview of the Proposed System

Sources for content aggregation and delivery are collected and organized in a container called as the Universal Knowledge Base (UKB). The UKB has all the resources that are required to present the appropriate content. These resources include the following:

- Textbooks
- Links for portals and discussion forums
- Research articles
- Presentations
- Universal knowledge classifications

All of these resources are considered as the "Knowledge resources". Each of the knowledge resource is used for a specific purpose at different stages. For example, links for portals and discussion forums are used to generate questions for self-assessment. The proposed system can be implemented by logically sequencing the following steps:

1) Knowledge Base Organization
2) Weighted Score Assignment
3) Determining Learner Comprehension Index and Content aggregation
4) Question bank generation
5) Self-Assessment, Feedback Processing and Content delivery

The architecture of the proposed system is as follows.

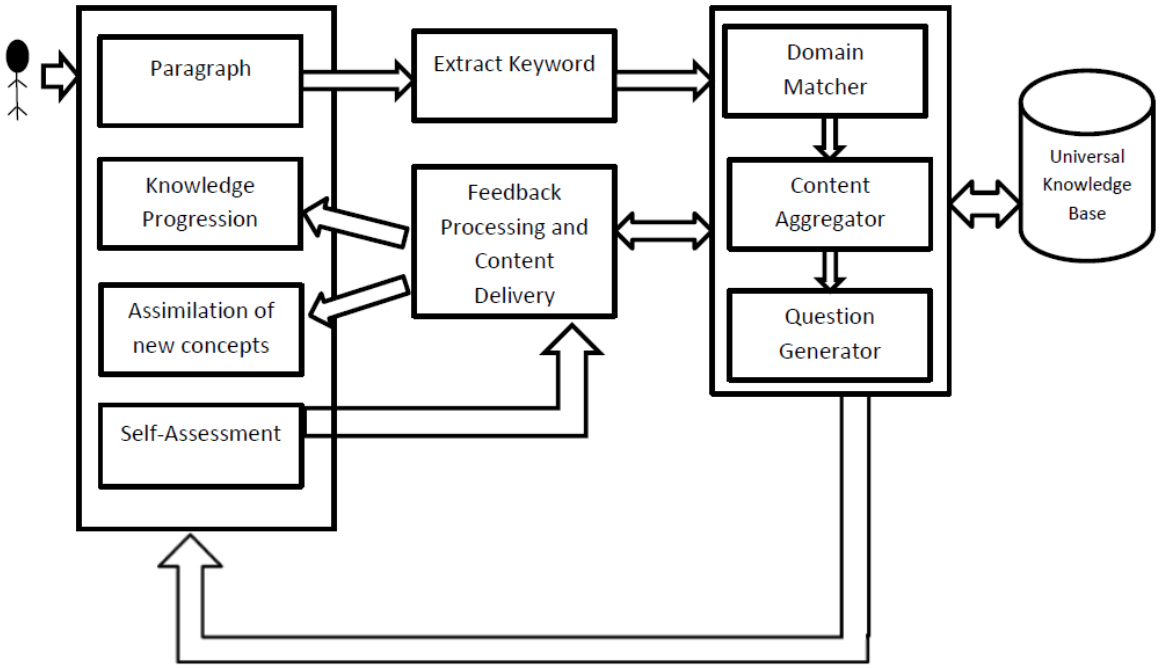

Figure 1: Architecture of the proposed system

Upon the organisation of the universal knowledge base, each of the knowledge resource will be assigned a score in the weighted score assignment step. This score helps to filter out the contents that are appropriate for the learner. In the third step, where the learner comes into picture for the first time, analysis of the learner is made to find the best available contents for the learner. It is done on the basis of the comprehension index of the learner. Learner is asked to express knowledge of the content which learner wishes to learn, in textual form. From the paragraph, comprehension index of the learner is determined. Based on this analysis, content from the knowledge resources are aggregated. From the aggregated content, a set of questions are generated to assess the level of understanding of the user. The proposed system differs from existing systems in a way that, assessment is made by the learner. This helps to determine the "self learning satisfaction index" of the learner. Based on this index, used as feedback, further assessment and content delivery is made.

The usage of profile is done in 2 stages-

1. *Profile creation:* In this stage, the user is going to enter details such as achieved proficiency in domains, subjects, in which the user is interested. These fields will be treated as static.

2. *Profile Evolution*: In this stage, evaluation is done and the profile is updated. For each learning process, the following fields will be added to the profile –

   Questions: Number of questions generated for the user entered paragraph.

Performance Index: Number of questions that are answered by the user. This is the field where feedback of self assessment is recorded.

Recommendation: Recommendation of the number of questions to be answered by the user, based on the profile created in the first stage.

In addition to the assessment through question-answering process, the user can select the required proficiency in the concept. The selection of proficiency should be made before the self assessment stage. The value of the 'recommended' field mentioned above changes with the selection of proficiency.

After each assessment, feedback of the user is recorded in their profile for further learning process.

In the 'Assimilation of new concepts' phase, the pre-requisite courses will be recommended by the proposed system. Initially, the Achieved Pre-requisite Index (API) will be calculated after analyzing the subjects or domains from the initial profile. The calculated API is further refined as the profile evolves with learning process.

III. Knowledge Base Organization

Universal Knowledge Base has classified set of domains. This keyword based classification is done using a set of qualifiers. Each domain encompasses a set of subjects. Subjects are assigned to a domain based on the keywords it represents as a subset of domain based keywords. Each subject has a particular set of knowledge resources. Each knowledge resource has a set of keywords representing the knowledge. Further, Knowledge resources are organized in terms of concepts, each one covering a part of the knowledge. Concepts are presented as set of multiple paragraphs; each paragraph represents a portion of a particular concept. The entire universal knowledge base can be organized hierarchically as shown below.

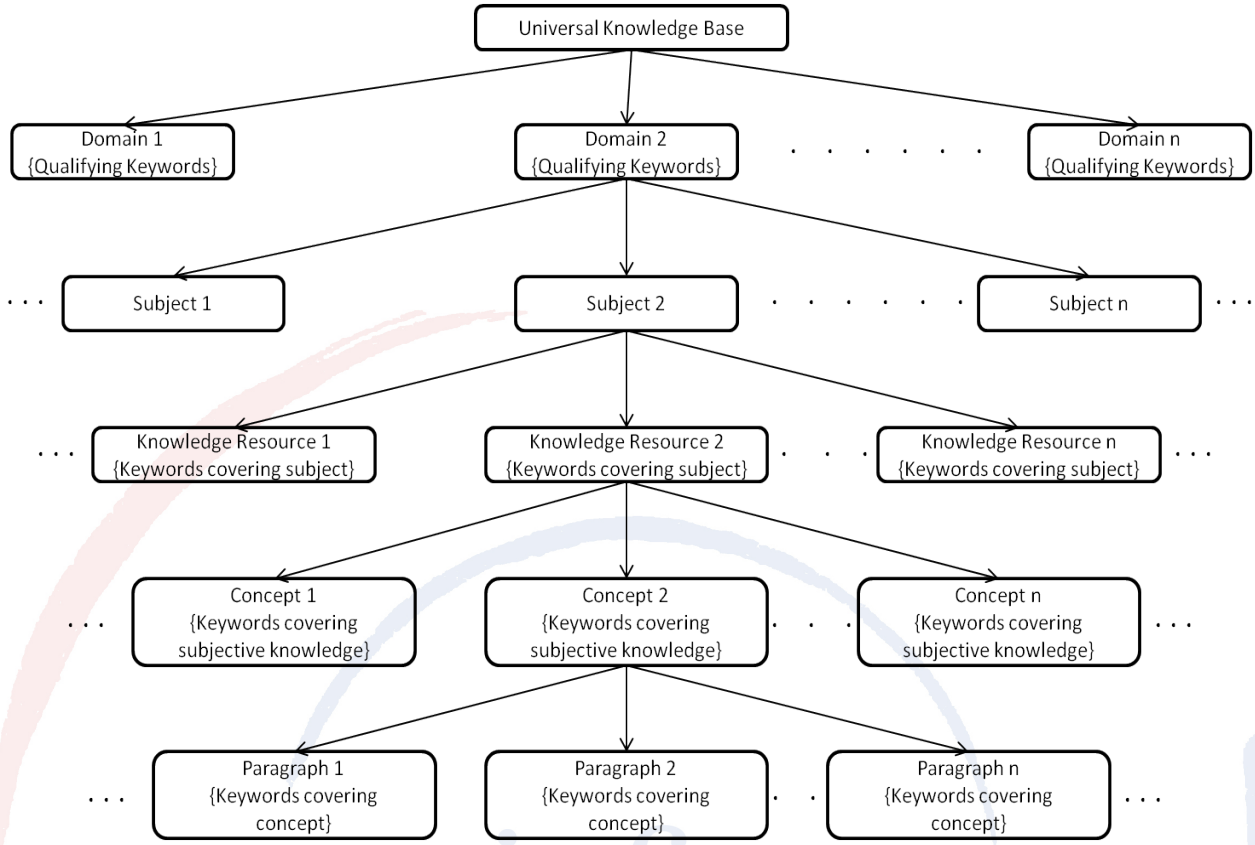

Figure 2: Knowledge Base Organization

From the above figure, we can list the components of knowledge base as follows

1. Domain
2. Subject
3. Knowledge Resource
4. Concept
5. Paragraph

Domain: Domains can be obtained from the available knowledge sources such as Wikipedia, DBPedia etc. We are using the available classification from the sources. Example for a domain could be "Computer Science".

Subject: Subject covers a portion of the domain. Example subjects that are under the computer science domain could be data structure, operating systems etc. Subjects may span across multiple domains. For example, microcontrollers come under both computer science and electronics domain.

Knowledge Resource: Subjects are described in various knowledge resources. Knowledge resources are the source of content for learning.

Concept: Each knowledge resource presents the content of the subject in-terms of concepts. Concepts are similar to chapters in the text-book.

Paragraph: Concepts are expressed in different paragraphs. Each paragraph is a distinct section in a concept.

IV. Weighted Score Assignment

The proposed system uses weighted scores to choose contents for aggregation and delivery. When the universal knowledge base is organised, scores are assigned. Assignment of scores is done based on the coverage factor which can be defined as the relative amount of knowledge a particular item covers with respect to a domain it belongs. From the coverage factor, scores at each level can be assigned as follows.

Subject Score = *keywords covering domain / Total keywords in the subject*

Knowledge Resource Score = *keywords covering subject / Total keywords in the knowledge resource*

Concept Score = *keywords covering knowledge resource / Total keywords in the concepts*

Paragraph Score = *keywords covering concept / Total keywords in the paragraph.*

In addition to assigning scores based on coverage, knowledge resources are further classified to distinguish between the "levels of specialization"/ "the level of difficulty". The classification is as follows

1. Text-books – for regular reading
2. Reference books – for obtaining deeper knowledge with much elaborated contents
3. Research Oriented books – for highly specialized reading

To distinguish the specialization level, knowledge resources are assigned weights. 1 for text-books, 2 for reference books, 3 for research oriented books. These weights are called 'specialization weights'. The scores are stored in the knowledge base itself.

V. Determining Learner Comprehension Index and Content Aggregation

The learner demonstrates knowledge of the concept by entering text related to the concept. The model extracts all keywords from the text. Based on the extracted keywords, the domain to which the concept belongs to can be inferred by referring to the universal knowledge base. A Score is assigned for the paragraph. These scores together are used to determine the index called "Comprehension Index" of the user. The Comprehension Index is used to determine the proficiency of the learner in the context of the concept. The scores are assigned based on two factors called "strength" and "weight". Strength measures the breadth wise knowledge and weight measures the depth wise knowledge. The whole process of learner analysis and content aggregation proceeds in the following stages.

1. Domain Filtering
2. Subject Filtering
3. Knowledge Resource Filtering
4. Concept Filtering
5. Paragraphs Filtering

*Domain Filtering***:** The aim of domain filtering is to select a domain where the learner written concept belongs. It is done with the help of strength and weight factors.

Domain Strength (DS) = *no. of domains covered/total domains in the universal knowledge base*

Lesser the value of domain strength implies that the textual content given by the learner falls in a domain. Larger the value, higher is the number of domains covered. In that case, the model asks the learner to re-write the concept. The process is repeated until the domain strength asserts single domain coverage. The above mentioned process is not expected to repeat because the entered content may not span across multiple domains.

Then the Domain Weight is calculated for each domain as follows

Domain Weight (DW) = *no. of keywords covering the domain / total keywords in the content of learner.*

The model selects the domain which has the highest value. It is guaranteed that, only one domain will have largest weight because the domain strength is less.

Subject Filtering: Once the domain has been selected, the model repeats the strength and weight calculation for the subject.

Subject Strength (SS) = *no. of subjects covered/total subjects in the domain*

Lower subject strength implies that the content expressed by the learner falls in a subject. Larger the value, higher is the number of subjects covered. In that case, the model asks the learner to re-write his concept. The process is repeated until the subject strength asserts single subject coverage. Similar to domain coverage, the process is not expected to repeat.

Similar to domain weight, the model calculates subject weight for each subject and the subject with highest subject weight is selected.

Subject Weight (SW) = *no. of keywords covering the subject / total keywords in the content of learner*

Similarly, the knowledge resource filtering and concept filtering are done using the following formulae.
Resource Strength (RS) = *no. of knowledge resources covered / Total no. of knowledge resources in the subject*.

Resource Weight (RW) = *no. of keywords covering the knowledge resource / total keywords in the content of learner.*

Concept Strength (CS) = *no. of concepts covered / Total no. of concepts in the knowledge resource*.
Concept Weight (CW) = *no. of keywords covering the concept / total keywords in the content of learner.*

After the above steps, the model would have deduced the concept expressed by the learner. As shown in the knowledge base organization, a concept can consist of multiple paragraphs. For each paragraph, paragraph weight is calculated using the formula

Paragraph Weight (PW) = *no. of keywords covering the paragraph / total keywords in the content of learner*

For paragraph filtering, the model uses a threshold value which is the average paragraph weight.
Threshold = $\sum$ *PW / no. of paragraphs*.
The proposed system, considers paragraphs whose PWs are above the threshold.
The content that is considered for question generation and later delivery is an aggregation of paragraphs selected in the previous stage.

VI. Question Generation

Once the domain and the subject are inferred, the model fetches all questions related to the concept which the learner wishes to learn, from the question resources which are associated with the subject. The question resources include question and answer portals and discussion forums. To generate questions, we are using the internally aggregated content. From this content, all keywords are extracted. Questions will be fetched from all the available question resources .The obtained questions for the user is an aggregation of the questions containing the keywords from all question resources.

A) Eliminate Redundant Questions

It is very likely that the same question will exist in multiple question resources. Therefore it is necessary to filter the questions obtained from each question resource. The model follows a two step filtering process.

Type 1 Filtering: Questions which contain the same words are redundant. All questions which have the same form, that is contain the same words are eliminated. Questions which do not contain the same words may also have the same meaning. Therefore redundancy still exists in the obtained question set. To eliminate this, the model goes for the second step of filtering.

Type 2 Filtering: Questions which are semantically equivalent to each other are redundant. The model eliminates all questions which are semantically equivalent. At the end of this two step filtering process we obtain the question set which contains questions which are distinct from each other.

VII. Self Assessment, Feedback Processing and Content Delivery

The learner is presented with the questions which were generated in the question generation phase. The learner attempts to answer the questions. The learner evaluates himself by calculating the user self satisfaction index.

User self satisfaction index=*number of questions answered correctly/total number of questions presented*.

The user self satisfaction index of the user for this concept is archived by the model. The learner has to determine if he is satisfied or not satisfied. This decision is a subjective measure and varies between users. The self satisfaction index of the user is taken as feedback. Feedback processing is performed as follows.

A) *If the learner is satisfied :*

The learner can switch to a new concept and start with either knowledge progression phase or assimilation of new concepts.

i) If the learner wishes to start the knowledge progression phase of a different concept the learner has to express his knowledge of the concept in textual form, answer the questions presented to him, calculate the user self satisfaction index and proceed with the knowledge progression phase if he is not satisfied or switch to assimilation of new concept.

ii) If the learner wishes to start the assimilation of new concept, he has to specify the concept. The model determines the prerequisite knowledge required. This is determined by traversal of the global knowledge base. The traversal starts from the root node in the tree till the required concept node is found. All siblings of this concept node which appear to the left of it and are at the same level are the required prerequisite concepts. The model evaluates the achieved prerequisite index(API) of the user for this concept .The achieved prerequisite index(API) of the user is the average of the user self satisfaction index of each of the prerequisite concepts

API = *sum (user self satisfaction index of prerequisite concept) / count (prerequisite concept)*

An API of 5 is considered the minimum score required to proceed with the assimilation of the new concept.

If the API is below 5 the learner is expected to proceed with the assimilation of the prerequisite concepts if the user is not familiar with the prerequisite concept or the learner can proceed with the knowledge progression phase of the perquisite concepts.

The learner can proceed with either of the above phases till the API is greater than 5 for the learner. Once the API is above 5, the learner can proceed with the assimilation of the concept which he desired to learn initially.

B) *If the learner is not satisfied:*

That is user self satisfaction index is low, the user is taken into the knowledge progression phase and presented with the content which was aggregated for the user.

The user is expected to learn the concepts presented to him and then express his understanding of the concept in a textual form. The user entered source is evaluated and the user comprehension index is evaluated. The user comprehension index of the user is expected to increase.

a) If the user comprehension index for this concept has not changed the user is presented with the same concept till the user comprehension index of the user increases.

b) If the user comprehension index has increased, questions which are generated for the advanced concept are presented to the user. Self-assessment of the user takes place. The user evaluates his user self satisfaction index and based on it, he can proceed with the knowledge progression or assimilation of new concept.

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Research of Questions and Answers Judgment Technique to Develop 4R Risk Prediction Training System

Araki Hidenori*1, Minowa Hirotugu*1, Munesawa Yoshiomi*2 , Suzuki Kazuhiko*1

*[1]Okayama University, Japan, *[2]Hiroshima Institute of Technology, Japan

0404

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Abstract

There are accidents which worker's lack of attention to a risk factor in cause of human factor.
Workers train to improve their risk prediction ability through 4R training method to prevent accidents by lack of risk prediction. The 4R method is learning method that the teacher judges worker's answers as right or wrong about risk which they indicate in the illustration shows in the work. The 4R method aims workers to improve imagination against risk by repetition of that workers find risk in the illustration shows in the work. However, there are some problems that workers cannot freely learn alone because there is a restriction which 4R method has to be done with their teacher and other worker.
Our research solves these problems to develop digital teacher in our 4R risk prediction training system which is able to substitute the human teacher in the conventional 4R method. The digital 4R training system helps workers learn spontaneously regardless of time or place even if there is no teacher. The 4R training system realizes same educational way with conventional method by it judges worker's answer as right or wrong instead of teacher.
In this paper, we propose the way to create content for the education and a method of natural language processing that is questions and answers to judge risk which a worker answered is correct. In addition, we report about the result of the evaluation experiment.
Research of questions and answers judgment technique to develop 4R risk prediction training system

1. Introduction

1.1 The current state of chemical plants

There are chemical plants that are dealing a large amount of chemicals and petroleum products. Those objects have dangerous with inflammability and explosion. Chemical plants are ran harsh environment under high temperature and high pressure for Efficiency of chemical reaction and stability maintenance of objects. Therefore, if an accident has occurred in a chemical plant, damage to businesses, serious environmental pollution, neighborhood facilities, local residents, workers and fatal accidents may be cause by an accident. It is important that an action is to prevent accidents and improve maintenance level for companies.

1.2 What is done in chemical plants?

It is necessity that risk prediction ability is to prediction and to accept against a risk for prevention accident. Director makes workers study education and experience for a risk in a virtual plant and filed exercise. Those purposes are to develop ability of a risk prediction in site. 4R training is generally development of thought for development ability of a risk prediction. This training can practice simplicity. In prediction training by 4R, a teacher show what are risks to workers against work. Next a teacher makes workers repeat risks and finger pointing and call. Thus a teacher makes workers take notice about risks.

1.3 Problem

4R lasts into 30-60 minutes to enforce. Therefore, it is reduced fifty-fifty five minutes. So it is not full for risk prediction training. Workers can't study alone because a director and workers must stay site. In addition workers practice similar works daily. It is difficult that a director always makes workers study new risk prediction training. And Training effect reduce [1] [2]. So far, 4R is stead to develop thinking power of countermeasure and to pick out risk for developing ability of a risk prediction. But it is a problem that 4R must be in good order environment.

1.4 Purpose of research・importance of system

In the present study, we propose a digital 4R training system to solve problems as previously noted. A director is changed a computer in 4R training. This solve problem that is necessary a director in previous 4R. In addition, this can solve problem of time and space. In this article, we report a procedure, a rule for the right or wrong to judge the answer by the free description of the trainer.

2. Digital 4R training system

2.1 flow of the training

We explain digital 4R training system in this section. The digital 4R training system shows a KYT seat like the 4R and is an education system that makes a trainer learned a risk. 4R is a kind of the risk prediction training [1]. The KYT sheet is the figure which expressed a state of the work that risk hides behind in. And we show the example of the figure in figure1. First, we show a KYT sheet and a problem sentence to a trainer.

Next, the trainer answers at the point where risk lies hidden in from a KYT sheet. Next, the trainer answers by a free description for a risk reason. Next, the digital 4R training system runs the right or wrong judgment for the answer of the trainer. Finally the digital 4R training system shows correct or incorrect to a trainer.

2.2 Design of the right or wrong judgment of the answer sentence

It is a correct answer or a non-correct answer or, by this system, must judge the answer by the freedom description of the trainer. We paid attention to the following item to realize the right or wrong judgment of the reply sentence mechanically.

A) Comparison of having necessary word or not

We assumed a necessary word a word to be an opportunity to notice potential risk. And we thought that it was the most important word.

B) Meaningful word

We thought that a risk reason, the thing such as the place were important in thinking about potential risk. We classified it in purpose object, cause (means, condition), damage point, four items of the predicate in a meaningful word.

I. explain predicate

The predicate is a verb to explain the movement of the meaning of the risk.

II. explain purpose object

The purpose object is a noun to cause the risk of the predicate

III. explain cause (means, condition)

The cause is a noun to become the cause to cause risk

IV. explain damage point

The damage point is a noun to show a part, the place that a worker injures.

C) Characteristic in the construction

I. explain the number of end morphemes

We analyzed an answer sentence. And it is the number that showed the number of end morphemes from the analysis result.

D) different notation synonym

Notation is different but different notation synonym is the same word meaning.

2.3 Technique procedure

We enforce right or wrong judgment for worker's reply sentences using a correct sentence.

We carry out the technique in a procedure of Step1 - Step9 as follows.

Step1: We prepare a KYT seat for training.

We prepared a KYT seat for training. We prepare the answer sentence (Sn) which I wrote down potential risk in Japanese for the risk of underlying n unit.

Step 2: We prepare verification data.

In this step we determinate verification data by section 2.2

In different notation synonym, it determined different notation synonym of the k joint of different notation synonym of the l unit for each predicate of

the m unit in the answer sentence Si We defined different notation synonym which synonym(Si, j, l), 1≦i≦n, 1≦j≦m, 1≦k≦l.

Step 3: we gobble down a reply sentence of trainer.
The trainer inputs a reply sentence, RS ,to explain potential risk. We analyze a reply sentence.

Step 4: we compare a correct sentence and reply answer.
From analysis result, we demand the number of morphemes of the correct sentence and the numerical difference of the numerical end morpheme of the morpheme of the reply sentence. We defined the number of end morphemes of the answer sentence as NMorpheme(Si). We defined the number of end morphemes of the reply sentence as NMorpheme(RSi). We defined the differences between NMorpheme(RSi) and NMorpheme(Si) as N. We defined AnsN as score of this step.We calculate mark AnsN of this item by difference N. We calculate a score according to formulas (1) here.
NMorpheme(Si) , it defined that 1 <= i <= n refers. NMorpheme (Rsi) , it defined that 1 <= i <= n refers.

$$N = \left| \mathrm{NMorpheme(Si)} - \mathrm{NMorpheme(RSi)} \right|$$

$$f(x) = \left.\begin{cases} N = 0, & \mathrm{AnsN} = 30\mathrm{points} \\ N = 1, & \mathrm{AnsN} = 20\mathrm{points} \\ N = 2, & \mathrm{AnsN} = 10\mathrm{points} \\ N = 3, & \mathrm{AnsN} = 0\mathrm{points} \end{cases}\right\} \ldots \mathrm{formulas}(1)$$

Step 5: we check having necessary words or not.
From analysis result, we check whether a reply sentence contains necessary words. And we calculate score of necessary words according to formulas(2).
We define it as necessary word of the j joint of the answer sentence SI with the necessary word of the m unit. We defined the necessary word as NecessaryWord(Si,j). We define it as number of items EN (entry number) used by a necessary word, a meaningful word in an answer sentence. We define the number of required words of data for judgments included in the reply sentence as RNN (return necessary words number).We set Threshold with 70 this time.

$$\mathrm{AnsNW} = \frac{\mathrm{Threshold} \times \mathrm{RNN}}{EN \times m} \ldots \mathrm{formulas}(2)$$

Step 6: I check having meaningful word or not.
A word used in a reply sentence compares it with each item in the meaningful word of data for judgments. And we check whether meaningful words of data for judgments are included in a reply sentence. We calculate the score of each item of the meaningful word according to formulas (3) ~ formulas (7).
We defined the score as AnsMW(MeaningWords). The predicate defines it as predicate meaningword.body(Si,j) of the j joint of the answer sentence having the predicate of the mb unit. The word of the item of the predicate in data for judgments defined the number of words included in the reply sentence as RMb (return meaning word.body number) in a predicate. The

purpose object defined it as meaningword.object(Si,j) targeted for the purpose of the j joint of the answer sentence having the purpose object of the mo unit. The word of the item for the purpose in data for judgments defined the number of words as RMo (return meaning word.object number) in a reply sentence in a purpose object. The factor defined it as cause meaningword.factor (Si,j) of the j joint of the answer sentence with the factor of the mf unit. The word of the item of the factor in data for judgments defined the number of words as RMf (return meaning word.factor number) in a reply sentence in a factor. I defined the damage point as damage point meaningword.injure (Si,j)) of the j joint of the answer sentence to have a damage point of mi toward. The word of the item of the damage point in data for judgments defined the number of words as RMi (return meaning word.injure number) in an reply sentence in a damage point. We defined the score of the item of the predicate as AnsMb(meaning word.body). The score of the item where we are the factorAnsMf (defined it as meaningword.factor.). We defined the score of the item of the damage point as AnsMj (meaning word.injure).

$$\text{AnsMb} = \frac{\text{Threshold} \times \text{RMb}}{EN \times \text{mb}} \ldots \text{formulas}(3)$$

$$\text{AnsMo} = \frac{\text{Threshold} \times \text{RMo}}{EN \times \text{mo}} \ldots \text{formulas}(4)$$

$$\text{AnsMf} = \frac{\text{Threshold} \times \text{RMf}}{EN \times \text{mf}} \ldots \text{formulas}(5)$$

$$\text{AnsMi} = \frac{\text{Threshold} \times \text{RMi}}{EN \times \text{mi}} \ldots \text{formulas}(6)$$

$$\text{AnsMW} = \text{AnsMb} + \text{AnsMo} + \text{AnsMf} + \text{AnsMj} \ldots \text{formulas}(7)$$

Step 7: Different notation synonym processing

When there are words same as different notation synonym for a reply sentence, we assume that the words existed in the item of the predicate and calculate a score according to formulas (8). We defined the score of the item of different notation synonym as AnsSw(synonym.word). We defined the number of words included in the reply sentence as RSw (return synonym.word number) in different notation synonym. M in formulas (8) is the number of words in data for judgments of the predicate.

$$\text{AnsSw} = \frac{\text{Threshold} \times \text{RSw}}{EN \times m} \ldots \text{formulas}(8)$$

Step 8: Calculation of the right or wrong judgment score

We assume the result that we added the score that I found by Step3~8 to the final score

If final scores are more than 70 points, we assume a reply sentence as correct.

If final scores are less than 70 points, we assume it to be incorrect.

$$\text{FS} = \text{AnsN} + \text{AnsNW} + \text{AnsMW} + \text{AnsSw} \ldots \text{formulas}(9)$$

Step9: Search end judgment

It finishes a right or wrong judgment.

3. Evaluation experiment

This chapter, we evaluated the right or wrong judgment performance of a correct sentence and the reply sentence that we proposed in this article.

3.1 evaluating method
In this evaluation experiment, we prepared a correct sentence and some reply sentence of workers for figure 2.figure 2 is a KYT seat. And we conduct subjected right or wrong judgment for those sentences.

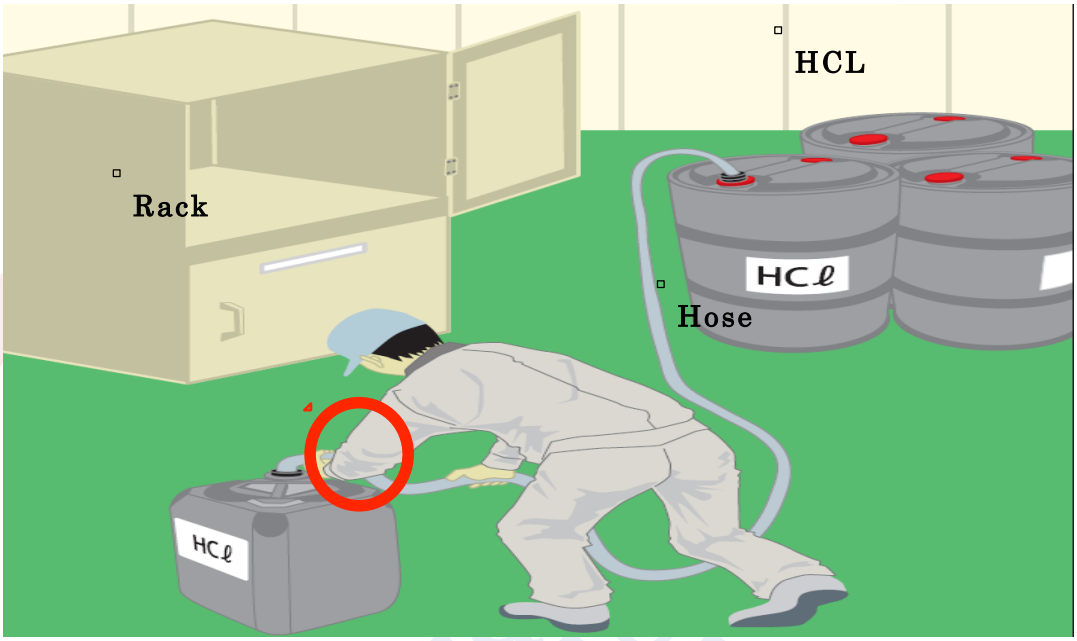

Figure 1 : A KYT seat

Problem sentence for figure 2 was “you are restocking a tank with HCL. Please the point of the circle answer for a risk reason”. We set out a correct sentence. A correct sentence was “a worker injures hands by HCL”. We set out necessary words and meaningful words by 2.2 sections before we analyze reply sentences of workers. We wrote down the result in the row of the correct sentence of table 1. And if there were synonyms, we wrote down the row of the synonyms of table 1. This time we prepared 5 sentences of reply sentences of workers.
The First reply sentence was “HCL attaches to hands, and the worker injures hands.
The second reply sentence was “the worker gets on HCL to hands and injures”.
The third reply sentence was “the worker cut s hands on the lid”.
The fourth reply sentence was “HCL is dangerous”.
The fifth reply sentence was “HCL hangs in worker’s hands”.
We calculated a score according to a procedure of the technique and, using the item which we decided for a reply sentence, carried out a right or wrong judgment to refer a score to reply sentence ①～⑤.We show the result in Table 1. 1 showed that correct sentence words were included the reply sentence. 2 showed that correct sentence words were not included the reply sentence. The row of final score in Table 1 showed final score of reply sentences. And the row of the result of right or wrong judgment in Table 1 showed right or wrong.

Table 1 ; experiment result

		Correct sentence	Reply sentence ①	reply sentence ②	reply sentence ③	reply sentence ④	reply sentence ⑤
neccessary word							
meaning word	Meaning word body	Injure	A	A	B	B	B
	meaning word object	HCL	A	A	B	A	A
	Meaning word factor						
	Meaning word injure	hands	A	A	A	B	A
Characteristic in the construction		3	3	3	2	1	2
Synonym		Get hurt, injure					
Final score			100	100	43.3	33.3	66.3
Result of right or wrong judgment			right	right	wrong	wrong	wrong

4. Result

We prepared 4-5 answer sentences for 14 correct sentences. And we subjected right or wrong judgment for them like 2.2 section. In addition, we researched whether contradiction occurred between the result of the right or wrong judgment and the meaning of the sentence. We show the result in table 2. In table 2, A shows that contradiction does not occur between the meaning of the sentence like the result of the right or wrong judgment. B shows that contradiction occurs between the meanings of the sentence with the result of the right or wrong judgment. So B calculated correct in the right or wrong judgment but incorrect semantically.

Table 2：result of right or wrong judgment

	reply sentence①	reply sentence②	reply sentence③	reply sentence④	reply sentence⑤
correct sentence①	A	A	A	A	A
correct sentence②	A	A	A	A	
correct sentence③	B	B	A	A	A
correct sentence④	A	A	A	A	
correct sentence⑤	A	A	A	A	
correct sentence⑥	A	A	A	A	
correct sentence⑦	A	A	A	A	A
correct sentence⑧	A	A	A	A	
correct sentence⑨	B	B	A	A	A
correct sentence⑩	A	A	A	B	
correct sentence⑪	A	A	A	A	
correct sentence⑫	A	A	A	A	A
correct sentence⑬	A	A	A	A	
correct sentence⑭	A	A	A	A	

5. conclusion

In this paper, we refer to a digital 4R training system for convenience improvement of 4R. In addition, we propose that a digital 4R training system is questions and answers judgment technique. We confirmed that 8B% of correct answers rate were caught. But we confirmed this evaluation result by hand working. We construct questions and answers judgment system in future. And we evaluate its performance

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Effects of Different Cognitive Load Courses in Game-Based Learning on Students' Visual Attention and Learning Performance

Pei-Chen Sun, Yung-shao Lin, Po-chi Huang

National Kaohsiung Normal University, Taiwan

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Abstract

Cognitive load is a critical factor affecting the learning performance of students. Previous studies have indicated the effectiveness of educational computer games for learning. However, there is little study on what effects of different cognitive load courses in game-based learning on students' visual attention and learning performance. This study was to investigate elementary school students' visual attention and learning performance using an educational computer game with different cognitive load courses. The subjects included students of fifth and sixth graders of an elementary school. One group was assigned to play the game of low cognitive load and the others were assigned to play the game of high cognitive load. Students whose visual attentions were recorded by the eye tracking system while playing the educational computer games. Content analyses were examined individual's Hot Zone image, fixation count and total fixation duration to indicate their attention. The experimental results show the high cognitive load group displayed the higher fixation count and total fixation duration to the text zones than low cognitive load group. The results also show the high cognitive load group had better learning achievements than low cognitive load group.

Keywords: *Cognitive load, Educational computer game, Interactive learning environments*

1. Introduction

Educational computer games have also been recognized as a popular trend in learning (Garris, Ahlers, & Driskell, 2002; Hwang & Wu, 2012). Previous studies have reported that educational computer games can enhance the learning interest of students (Ebner & Holzinger, 2007; Malone,1980), and further increase their learning motivation (Burguillo, 2010; Dickey, 2010; Harris & Reid, 2005; Miller, Chang, Wang, Beier & Klisch, 2011). In the past decade, previous studies have indicated the effectiveness of educational computer games for learning, such as mathematics (Chang, Wu, Weng & Sung, 2012; Lowrie & Jorgensen, 2011), computer science (Cagiltay, 2007; Papastergiou, 2009) and geography (Tüzün, Y.lmaz-Soylu, Karakus, Inal,& K.z.lkaya, 2009). However, there is little study on what effects of different cognitive load courses in game-based learning on students' visual attention and learning performance. However, Intrinsic cognitive load is an interaction between the nature of the material being learned and the expertise of the learners, which cannot be directly influenced by instructional manipulations (Paas & Kester, 2006). Thus this paper aims to investigate elementary school students' visual attention and learning performance using an educational computer game with different cognitive load courses, only intrinsic load were affected in the present study.

Based on the eye-mind assumption that eye fixation locations reflect attention distributions (Yang, Chang, Chien, Chien, & Tseng, 2013; Just & Carpenter, 1980), the eye tracking method can reveal the temporal change of visual attention that may further inform how learners approach and process information during learning. In general, eye fixation duration reflects processing difficulty and amount of attention and eye fixation location reflects attention. Therefore, we are particularly interested to use eye tracking method in game-based learning. To probe in-depth into how students learn concepts in the educational computer game with different cognitive load courses, we conducted a study that examined students' visual attention in terms of their eye-movement patterns as they were given an educational computer game.

2. Literature review

2.1. Cognitive load

Cognitive load refers to the informational load that is being processed in working memory (Van, Paas, & Sweller, 2010). Cognitive load theory explains that there is a certain amount of information that can be processed in working memory at one time without overloading processing capacity. Thus, when cognitive load is increased beyond our working memory capacity, learning is depressed (Pastore, 2012).

There are three types of cognitive load: intrinsic, extraneous and germane (Sweller, 2010 ; Chang, Tseng, & Tseng, 2011). Intrinsic cognitive load is an interaction between the nature of the material being learned and the expertise of the learners, which cannot be directly influenced by instructional manipulations (Paas & Kester, 2006). Extraneous load happens when a learner engages in a cognitive processing that does not support the learning objective, such as poor layout, whereas germane load occurs when a learner engages in a deep cognitive processing that mentally organizes the material and relates it to prior knowledge, meaning that a learner's motivation and prior knowledge are enhanced and connected with prompts and supports in the lesson

(DeLeeuw & Mayer, 2008). Due to intrinsic cognitive load is inherent to the task complexity. In the experiment described in this paper, intrinsic s load is being manipulated with different cognitive load courses.

2.2. Educational computer game

Kinzie and Joseph (2008) indicated that "a game is an immersive, voluntary and enjoyable activity in which a challenging goal is pursued according to agreed-upon rules." Owing to the rapid advancement and popularity of computer and communication technologies, researchers have predicted that more technology-based learning will occur, and educational computer games could play an important role in education (Prensky, 2001). In the past decade, many studies have been conducted to investigate the effectiveness of educational computer games for various courses, such as mathematics(Chang et al. 2012; Lowrie & Jorgensen, 2011), natural science (Hwang, Wu, & Chen, 2012), Science (Meluso, Zheng, Spires, & Lester, 2012), computer science (Papastergiou, 2009), social science (Cuenca López & Martín Cáceres, 2010), geography (Tüzün et al., 2009), language (Liu & Chu, 2010) and decision-science (Chang, Peng, & Chao, 2010). Researchers have indicated the potential of employing educational computer games in helping students improve their learning performance (Brom, Preuss, & Klement, 2011; Huang, Huang, & Tschopp, 2010; Wang & Chen, 2010). For example, some studies have indicated that digital games are an important part of the development of children's cognition and social processes (Kim, Park, & Baek, 2009; Yien, Hung, Hwang, & Lin, 2011).

In the context of changing world, instructional designers and teachers have increasingly embraced students' interest in digital games, as well as the design advantages provided by modern computing. Games are a very rich interactive medium for enhancing the fun factor of the learning experience, and allow the players to explore the rules of the game world by trial and error (Moreno-Ger, Burgos, Martinez-Ortiz, Sierra, & Fernandez-Manjon, 2008; Torrente, Lavín-Mera, Moreno-Ger, & Fernández-Manjón, 2009). By means of digital games, and especially of digital educational games, learners should be able to apply factual knowledge, learn on demand, and gain experience in the virtual world, all of which can later shape their behavioral patterns and directly influence their reflection (Pivec, 2007). Many educational game designers also advocate developing simpler games at a more reasonable cost in contrast to commercial off-the-shelf games. Researchers have indicated that those educational games with simpler interfaces could be more beneficial to learners owing to the lower requirements for technical skills (Torrente et al., 2009). Such a viewpoint conforms to the need for developing spatial learning tools with a game-based approach since the learners are elementary school students (Hung, Hwang, Lee, & Su, 2012). Many research have reported that educational computer games can enhance the learning interest of students (Ebner & Holzinger, 2007; Malone,1980), and further increase their learning motivation (Burguillo, 2010; Dickey, 2010; Harris & Reid, 2005; Miller et al., 2011).

3. Method

3.1. Participants

The participants of this study were grade 5 to 6 elementary school students. A total of twenty-one students voluntarily participated in the study. One group was assigned to play the game of low cognitive load and the others were assigned to play the game of high cognitive load. The low cognitive load group, including ten students, was guided by the educational computer game that teaching materials with geography, while the high cognitive load group with eleven students was guided by the educational computer game that teaching materials with mathematics. All participants passed the eye-tracking calibrations. Students whose visual attentions were recorded by the eye tracking system while playing the educational computer games.

Fig. 1. The shooting games let the participants try to avoid the enemy's attack and try to return fire the correct answer at the same time.

3.2. Materials

Two same shooting- games was prepared for the study. The gameplay of shooting-game is that players try to avoid the enemy's attack and try to return fire at the same time (see Fig. 1). Shooting- games consisted of 6 minutes learning materials on the topic of "mathematics" and "geography". "Mathematics" which is about positive number and negative number and "geography" which is about France, Germany, Italy and Spain's culture and architecture. This educational computer games has three part, the first part gives the practice of the lesson. The second part contains one or two slides of learning materials. The last part let the participants try to avoid the enemy's attack and try to return fire the correct answer at the same time. The content and the design of the educational computer games presentation were constructed a

mathematics and geography education researcher. We ensured that the learning materials used in the educational computer games that the participating students might have read prior to the study.

3.3. Apparatus

This study employed the i-Seizer Lite Version eye tracking system developed by Utechzone Co., Ltd., which is a fully automated eye tracking system. The system consists of one desktop computer and one i-Seizer Eye Tracker. It is able to provide eye movements data. The average sampling rate of i-Seizer Eye Tracker is 60 Hz, that is, 60 eye-movement samples are captured in one second. A 17-inch flat panel monitor with a resolution of 1280x1024 was used to display the educational computer game to the participants. Participants played the game using a mouse. i-Seizer Lite Version eye tracking system installed in the desktop computer was used to store and analyze the gaze data.

3.4. Procedure

At the beginning of the learning activity, the students took the pre-test. During the learning activity, one group was assigned to play the game of low cognitive load and the others were assigned to play the game of high cognitive load. The eye tracker was then placed on a table in front of the subject about 60 cm away. Each participating student went through a calibration process for the eye tracker to capture the correct positions of the student's eye movements. The educational computer games took about 9 min to complete. During the games, recording system was utilized for the researcher to examine the students' eye movements. This system overlaid both the educational computer games on a computer screen and the students' eye movements. After the learning activity, the students took the post-test.

3.5. Data analysis

For the purpose of examining the Participants' attention distributions on the different components of the educational computer games, each game part was divided into several 'Region of Interest' text zones consisting of learning materials. To summarize the eye movement patterns on each game part, eye-movement measures including total fixation duration and fixation count were used. Total fixation duration represent sum of durations of all fixation points on a 'Region of Interest', and fixation count represent sum of number of all fixation points on a 'Region of Interest'. An observation on individual Hot Zone map was conducted for exploring participants' attention. The eye-movement data were exported to Excel, and SPSS was then applied for further statistical analyses.

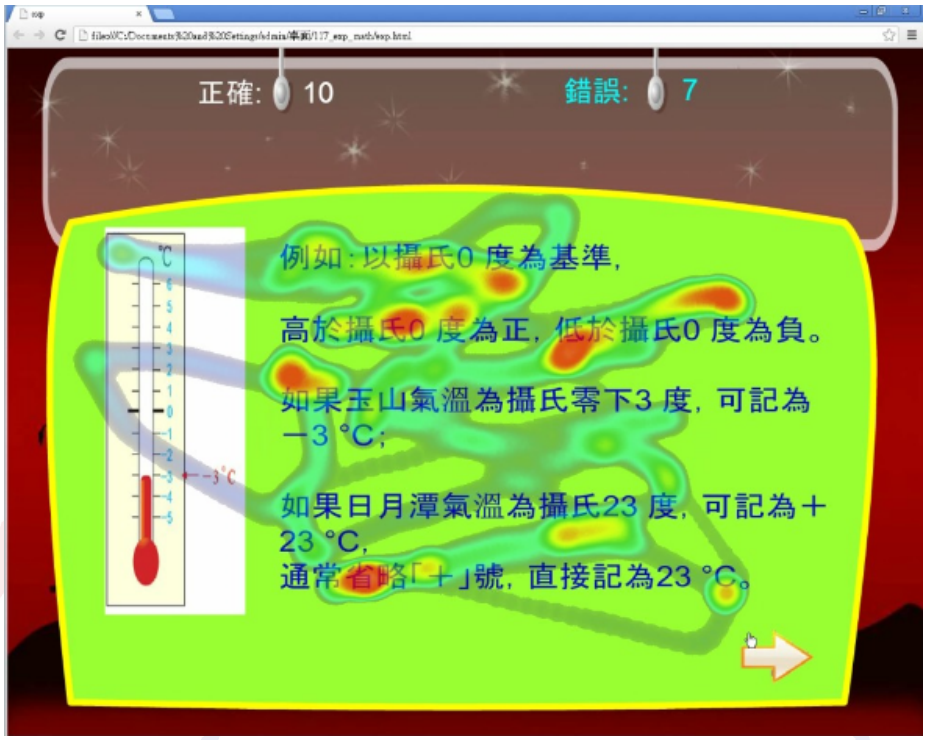

Fig. 2. As the graphics show, Students were focus on the 'Region of Interest' in the learning materials on the topic of "mathematics".

4. Results

4.1. Heat Map

In order to describe an entire screen of a participant's visual attention on the educational computer games, we analyzed the Heat Map. In the Heat Map, the mapped color varied from individuals' total fixation duration on the screen. The red or orange spots represented locations where the participants had been accumulated longer total fixation duration while blue colors represented locations where the participants had been accumulated shorter total fixation duration. In the educational computer games, most of the students paid most attention to 'Region of Interest' consisting of learning materials. Figs. 2 and Figs. 3 show the result.

It shows students are able to focus on the learning objectives and attraction of the game. However, an accumulated amount of attention on a particular area seems not enough for understanding different cognitive load courses in educational computer games. Therefore, total fixation duration and fixation count on the 'Region of Interest' was further conducted to show the visual attention by participants in different cognitive load courses groups.

Fig. 3. Comparison of eye movement patterns on the 'Region of Interest' between learning materials and play zone. As the graphics show, the fixation densities of the students were higher on 'Region of Interest' learning materials.

4.2. ANOVA with different cognitive load courses

To investigate whether participants had difference in the different cognitive load courses, we conducted three parts of educational computer games ANOVA with participants' fixation duration and fixation count on 'Region of Interest' learning materials. The results of measures analysis on fixation durations are shown in Table 1. For three parts of educational computer games, significant differences were found in the first part of games also fixation duration and fixation count, but there were no differences in the second part and the last part of games.

Table 1

ANOVA with different cognitive load courses

Game parts	Variables	VS	SS	Df	MS	F	p
First part	fixation count	Between	11092.57	1	11092.57	14.64	.001
		Within	14395.24	19	757.644		
Second part		Between	1342.48	1	1342.48	.312	.583
		Within	81771.801	19	4303.78		
Last part		Between	7391.09	1	7391.09	.424	.523
		Within	331068.15	19	17424.64		
First part	fixation duration	Between	585.19	1	585.19	9.402	.006
		Within	1182.54	19	62.24		
Second part		Between	282.39	1	282.39	.953	.341
		Within	5628.98	19	296.26		
Last part		Between	179.19	1	179.19	.261	.615
		Within	13046.77	19	686.67		

4.2 Visual attention distributions for different 'Region of Interest'

To further examine students' visual attention in our games, two paired t-tests were conducted to compare the fixation duration and fixation count in the last game part between 'Region of Interest' learning materials and 'Region of Interest' play zone. Regarding fixation duration, the paired t-test on fixation durations between 'Region of Interest' play zone (M = 267.1 s, SD = 139.23) and 'Region of Interest' learning materials (M = 109.49 s, SD = 25.72) show significant difference (t = 4.983, df = 20, p = .000), while the paired t-test on fixation count between 'Region of Interest'

learning materials (M = 404.48, SD = 130.09) and 'Region of Interest' play zone (M = 92.89, SD = 50.82) also show significant difference (t = 8.386, df = 20, p = .000). Despite on fixation duration, play zone show significant difference with learning materials. Fixation count learning materials show significant difference with play zone. This phenomenon is due to the design of the game that participants see the questions and try to return fire the correct answer at the same time. Therefore, the results seemed to support students allocated much of their attention to learning materials.

4.3 Analysis of learning achievement

One of the objectives of this study was to examine the effectiveness of the educational computer games in terms of improving the learning achievement of the students. ANCOVA was used to examine the difference between the post-test scores as dependent variables and the pre-test scores as the covariate. The homogeneity test result showed that the post-test scores of the two groups were homogeneous (F = 0.33, p = 0.86 > 0.05), implying that ANCOVA could be applied. Table 2 summarizes the ANCOVA results, in which the adjusted mean values of the post-test scores were 72.73 for the high cognitive load group, and 53 for the low cognitive load group.

Table 2
Descriptive data and ANCOVA of the post-test results.

Group	N	Mean	S.D.	Adjusted mean	Std. error	F	p
high cognitive load group	11	72.73	25.08	71.82	6.41	3.469	.079
low cognitive load group	10	53.00	20.66	54.00	6.74		

5. Discussion and conclusions

In this study, we used the eye tracker to record and analyze learners' visual attention distributions over the educational computer games. Our study showed that during playing the games, the students allocated much of their attention to learning materials. When playing the educational computer games, visual attention increased for 'Region of Interest' text zones consisting of learning materials, compared to 'Region of Interest' play zone. Although in the Heat Map there was no difference of the pictures between the different groups, further analyses of the fixation count and total fixation duration revealed that the high cognitive load group displayed the higher attention to the text zones than low cognitive load group. Finally, the post-test showed the high cognitive load group had better learning achievements than low cognitive load group.

In sum, this study explored students' visual attention during a educational computer games on different cognitive load courses. The findings of attention allocations help instructional designers and teachers to understand students' potential misconceptions or difficulties in different cognitive load courses and further design suitable educational computer games. As educators, our primary aim is to study students' learning processes by using eye tracking system. Therefore, future studies may apply

eye tracking system to explore the cognitive process of different cognitive load courses and investigate the potential and limitation of its applications in future educational computer games. More communication is needed among technology developers, eye tracking system researchers, and educators to carry out such an implementation.

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Integrating Interactive Whiteboard Technology on Pre-Service Teacher Preparation: Process and Outcomes

Emilia Zarco, Fayth Vaughn-Shavuo

Adelphi University, USA

0415

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Abstract

Interactive Whiteboards became very popular among P-12 schools in the US. Teacher preparation programs found themselves catching up to the need of equipping pre-service teachers in using this technology. This study focuses on the process and outcomes of integrating interactive white boards (IWB) specifically SMARTBoards in pre-service teacher preparation programs at a private university. A case study approach utilizing a cohort of School of Education (SOE) students assigned for fieldwork at an identified high needs/low resources public elementary school was used. A questionnaire determining baseline technology perceptions, attitudes and skill level was administered at the start and end of the semester. This data was supplemented by focus group discussions to contextualize SOE students' perceptions, attitudes, confidence, and satisfaction levels of using interactive whiteboards in P-12 classrooms. Furthermore, the "Notebook" lessons and field-based teacher observation forms were analyzed to determine connections, relationships, and concerns emerging from interactive whiteboard classroom technology use and learning outcomes among P-12 students. The 5E framework (Engage, Explore, Explain, Expand, and Evaluate) was applied as a guide for lesson plan development (Martin, Sexton, & Franklin 2009). A framework based on the Individualized Inventory for Integrating Instructional Innovations (i5) was refined to help ensure the likelihood of success of technology based projects in the classroom and identify potential barriers that hinder technology integrating efforts (Groff & Mouza 2008). The framework focuses on the role of teachers (methods and field-based teachers), students (SOE students) and contextual factors (training, logistic support, technology infrastructure, etc.). Preliminary outcomes of the study will be shared and the framework for technology integration will be discussed for further refinement and usefulness.

Introduction

The board has been the centerpiece of classrooms since the invention of the black slate writing boards (also known as chalkboards) as early as 1801. Blackboards revolutionized education by providing a medium of visually presenting information to students at the same time and engage in a learning discourse. Schoolhouses across the United States adopted the medium and blackboards became the primary all around educational fixtures for about 200 years. In the 1960s green colored boards with chalk powder gained popularity and the term "chalkboards" became a mainstay in education. By the mid-1980s, whiteboards or marker boards or dry erase boards began to appear and by the late 1990s, almost a fourth of all US school converted from blackboards to whiteboards. With the rapid influence of technology, presentation media continued to evolve and the first interactive white board was introduced by SMART Technologies in the early 1990s. A SMART Board is simply a whiteboard displaying the image from the computer monitor with the surface operating as a giant touch screen. The computer is controlled from the board itself through touching or using an electronic pen. The magic of technology and the whiteboard combined provides teaching and learning the potential for enhanced engagement and interaction in the classroom, supporting different learning styles (visual-spatial, auditory and kinesthetic), and increasing collaboration among students and teacher in the teaching and learning process.

Interactive whiteboards and their potential for enhancing learning soon caught up with schools in Long Island, New York and before long, almost all of the schools in Long Island had SMART Boards. The New York Basic Educational Data System (BEDS) reports from 2010 onwards that more than 90% of schools in the Long Island region are using SMART Boards. The School of Education at Adelphi University soon realized the need to prepare students to use SMART boards before they go out and student teach in these school districts. Through the SOE Technology Committee, SMART boards were installed in several classrooms. Furthermore, a zero credit 4-hour workshop was developed and required for all SOE students before they go out to schools to observe and student-teach. A cadre of SMART Board trainers from both university and k-12 schools were put together to implement the training.

Literature Review

The use of interactive whiteboards (IWBs) has continued to grow exponentially worldwide since their introduction into classrooms in 1991 (Manning Awards 2002). Defined as a display screen that when connected to a computer and projector in a closed loop can be controlled by the board itself, the SMART Board is most widely used in P-12 schools although it has commercial applications. Nearly one million IWB displays were purchased in 2012 alone (Rave 2013; Leneway 2012) even with the growing competition of the smaller tablets. As a replacement for the chalkboard, the IWB is still instrumental in large group instruction in P-12 classrooms, while tablets because of their design structure appear to have been most effective with individualized use patterns.

There is a growing body of research pointing to the effectiveness of the infusion of IWBs in the teaching and learning process. The positive impact is abundant in

elementary, secondary, and higher education levels (McNeese 2007). In the five-year study evaluated by McNeese, the faculty participants concluded that "the SMART multimedia classrooms enhanced both student face-to-face participation and e-learning."

Mechling, Gast, and Krupa (2007) explored the positive impact of the use of the SMART Board on the ability of mildly disabled students in a small group to read sight words. The results indicated that all students reached the criteria for their target set of words within six sessions for each set of words. The authors attributed this to the, "… large screen for delivering target information,…by making images more visible, and increasing attention to the task." Gaitlin (2007) studied the impact of the interactive whiteboard on student achievement by using a pre- and post-test design with 140 students in fourth, fifth, and sixth grade classrooms. Focusing on the content areas of mathematics, English language arts, and science, he determined that students whose teachers used an interactive whiteboard during the teaching and learning process achieved statistically significant gains over the students whose teachers did not use this target technology. In a meta-analysis of instructional applications of the IWB, Dostal (2011) summarizes the instructional advantages of the effective use of this tool to support the teaching and learning process. Although more disadvantages are listed, they all point back to the teacher's ability to effectively use this tool. The IWB is a tool that does not and cannot replace best practices in teaching (Morgan 2010; Preston & Mowbray 2008).

Carpenter (2010) explored the essential conditions for effective use of SMART Boards to raise student achievement. She summarized:

> The meta-analytic findings suggest relatively large percentile gains in student achievement under the following conditions:
> - A teacher is experienced
> - A teacher has used an interactive whiteboard for an extended period of time.
> - A teacher uses an interactive whiteboard extensively in the classroom but not beyond 80% of the time.
> - A teacher has high confidence in his or her ability to use the interactive whiteboard.

Despite the dramatic increase in the purchase of IWBs as classroom resources and the strong evidence of their effectiveness as a tool in the teaching and learning process, additional evidence points to the reluctance of veteran teachers to use IWB effectively in classrooms (Heath & Judd 2009; Schneckenberg 2009). Given the potential effectiveness of this instructional tool, resistance to infusing it into classroom instruction is perplexing, at best. In exploration of the root causes of this resistance, Shen and Chuang (2009) worked with 340 fifth and sixth grade students in Taiwan to determine the impact of attitudes and behaviors on IWB usage. In a design that incorporated the use of online surveys, the researchers determined that use of the IWB as a tool is highly correlated with attitudes regarding interactivity and ease of use, as well as perceptions of usefulness.

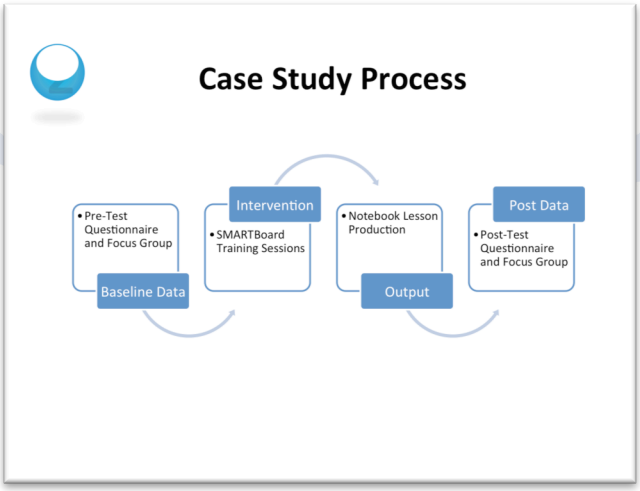
A review of the literature suggests the need for further exploration of the attitudes and behaviors on IWB within the dynamics of the veteran teacher and the pre-service

candidate within the classroom. Will our pre-service teaching candidates, as digital natives (students who have grown up in the age of digital technology), have more positive attitudes and behaviors related to the use of the IWB? Will they bridge the gap in the classroom between the resistance of the veteran teacher and the instructional needs of the children? Will a symbiotic relationship develop in which the veteran teacher provides instructional methodologies and the pre-service teaching candidate demonstrates the technological applications in support of those best practices using the IWB? *Integrating Interactive Whiteboard Technology on Pre-Service Teacher Preparation: Process and Outcomes,* provides documentation of this exploration.

Purpose and Methods

This study describes the process and outcomes of integrating interactive white boards (IWB) specifically SMART Boards in pre-service teacher preparation programs at a private university. A case study approach utilizing a cohort of School of Education (SOE) students assigned for fieldwork at an identified high needs/low resources public elementary school was used. A questionnaire determining baseline technology perceptions, attitudes and skill level was administered at the start and end of the semester. This data was supplemented by focus group discussions to contextualize SOE students' perceptions, attitudes, confidence, and satisfaction levels of using interactive whiteboards in P-12 classrooms. Furthermore, the "*Notebook*" lessons and field-based teacher observation forms will be analyzed to determine connections, relationships, and concerns emerging from interactive whiteboard classroom technology use and learning outcomes among P-12 students. Figure 1 describes the case study process and the points of data collection. It is important to note that after the baseline pre-test and focus groups were conducted, the cohort of SOE students were required to attend the zero credit SMART Board training sessions (Intervention) and produce a lesson plan using *Notebook*, the SMARTboard software (Output), then post-test and focus groups were again conducted.

Figure 1



The **i5 framework: student factors only** (Groff & Mouza 2008) was used to guide the development of questions used in pre-test/post-test and focus group discussions in describing students' technology beliefs, attitudes and skill level. The Individualized Inventory for Integrating Instructional Innovations was developed as a framework to address challenges in classroom technology use. The student factors include: experience and background, technology proficiency and attitudes and beliefs. Based on this framework, the following variables were included in this study: student beliefs, attitudes, self-rated general technology skills, SMART Board skills and technology integration skills.

The 5E framework in instruction (Martin, Sexton, & Franklin 2009) was the framework used in both the SMART Board training sessions and the lesson plan structure. This framework is an inquiry based approach that guided the teaching and learning process during the training sessions and during the creation of the lessons plans using *Notebook*, the SMART Board software and delivery of their lessons using SMART Board. The framework has 5 components namely: Engage, Explore, Explain, Expand and Evaluate. The following table (1) is an example how the framework is used in a lesson plan using SMART Board and *Notebook*.

Table 1: 5E Framework

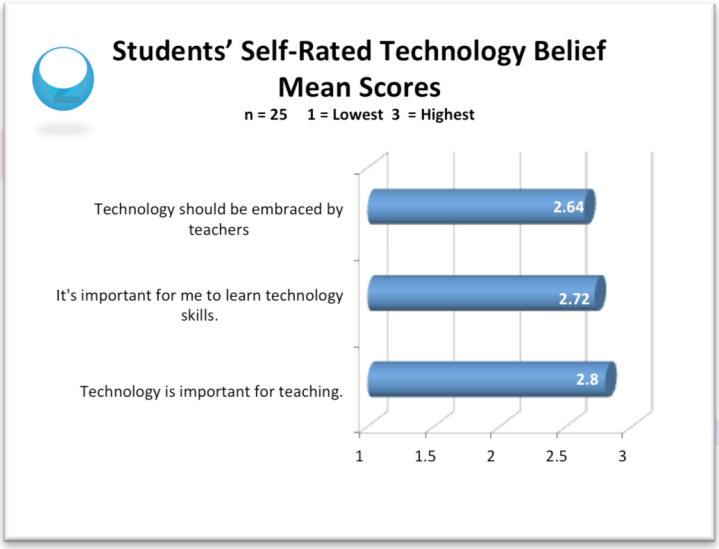
5E Component	**Sample Lesson Plan Guide Questions**
Engage	What is your motivation to engage the students? Set the purpose of the exploration. Discuss the inquiry.
Explore	Discuss the materials and safety procedures with students. Have students conduct their experiment.
Explain	Have students tell you what they did and what they found out. Ask why they reached those results and if they were the expected results.
Expand	Have students record their reflections in their science journal (journal book). Pictures are a starting point for all grade levels. Guide students to include inquiry, materials, procedures, observations, and conclusions using age appropriate language. Encourage students to make real world applications of their concepts.
Evaluate	Informally assess student journal records by having students share

Preliminary Findings and Discussion

The cohort of SOE students going for fieldwork at an identified high needs/low resources public elementary school were composed of 20 females who were enrolled in 2 fieldwork based methods classes.

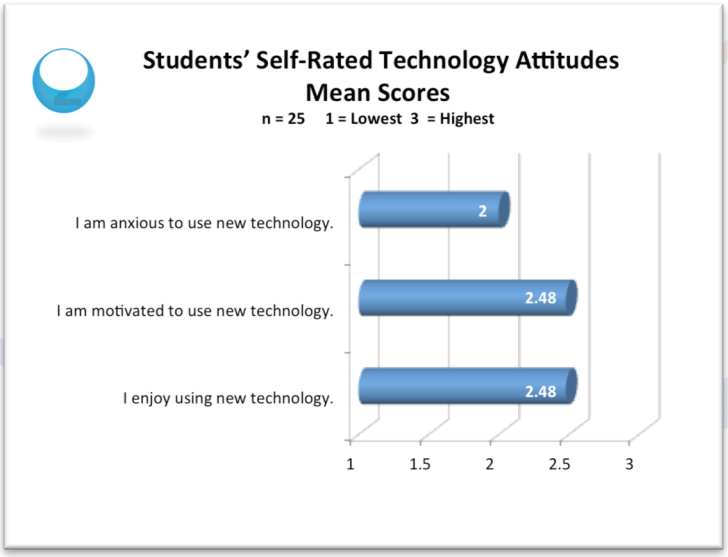
Students' Beliefs. Three questions in a scale of 3 were used to get a perspective of student's beliefs. Students revealed positive technology beliefs with "technology is important for teaching" rating the highest, followed by "it's important for me to learn technology skills" and "technology should be embraced by teachers" (Figure 2).

Figure 2



Students' Attitudes. Questions addressing attitudes included anxiety, motivation and enjoyment. "I enjoy using technology" rated the highest followed by "I am motivated to use new technology". The students expressed some amount of anxiety. (Figure 3)

Figure 3



These attitudes and beliefs were corroborated by the focus group responses as described below:

"I enjoy using technology because...

- It's more efficient

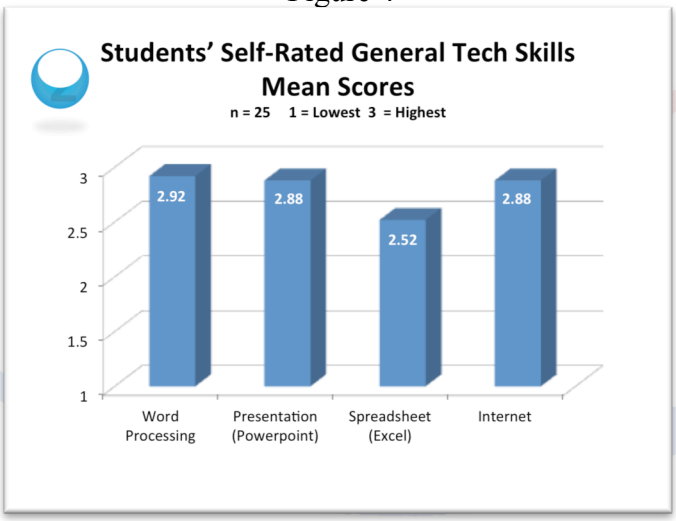
- It's entertaining
- It's engaging"

"I enjoy using technology in my teaching because...

- The kids enjoy it
- It reaches all types of learners
- I think that it is important life skills for the future, for us to be able to learn how to use technology at a young age
- It something that I'm comfortable using so it would be… make my teaching more efficient if I use it rather than writing on the board
- it's engaging and I think that it's a great tool, probably a lot more cost effective; rather than having tons and tons of manipulatives, you can just have the manipulatives on the board for you ready, You don't have to spend time in the classroom pulling out paper things, where it is already on the board; you can just pull up a ruler or anything that you need to use"

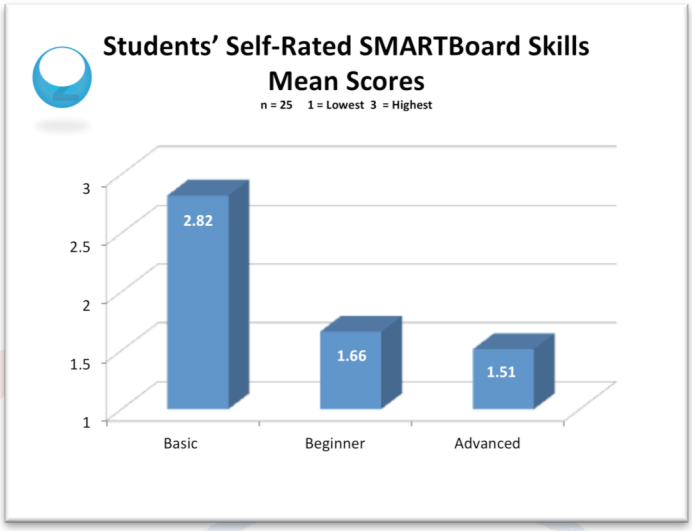
Students' General Technology Skills. Overall, student participants rated themselves as possessing a comfortable level of working with technology. (Figure 4)

Figure 4



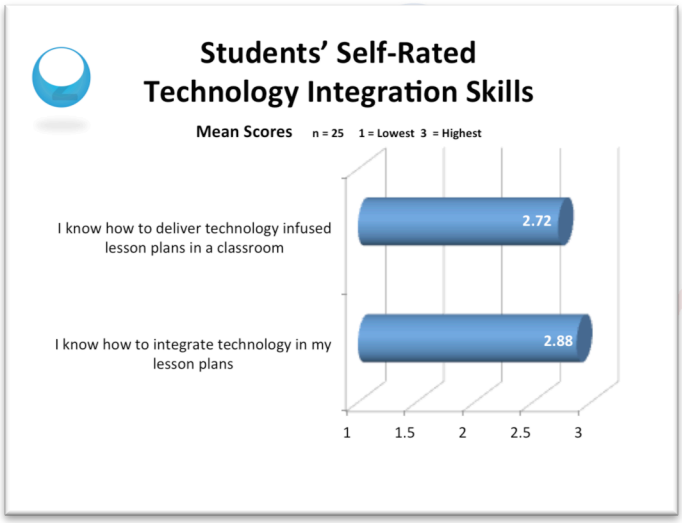
Students' SMART Board Skills. Most of the student participants rated themselves at the basic level of SMART Board skills. (Figure 5)

Figure 5



Students' Self Rated Technology Integration Skills. Student participants were confident of their skills to integrate technology into their lessons in the classroom. (Figure 6)

Figure 6



The focus group responses revealed some interesting insights from student participants in how technology could be successfully integrated in the classroom. They have confirmed the lack of technology integration in the classroom and believed that there is urgency to address the need.

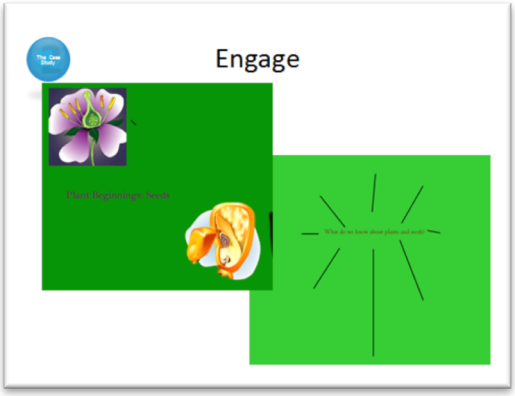
- "Well, that's how I feel like, too, is right now there is kind of a big gap with the kids that are in elementary grades right now and those that are teaching them, … And I feel that with our generation coming up…that we would be able to help bridge that gap a little bit, because we kind of understand more and I feel that maybe we can tap into it, because I feel like some teachers maybe feel helpless because they are just not informed

themselves that they can't really help them (children) in that sort of sense, while I think someone of the younger generation could."

- "She (my mentor teacher) actually tells me, "You really need to make sure that you are always on top with your technology. It's changing and most teachers, the old teachers, they don't like it; they don't like the change, but she's like, "You're messing with the kids then, because kids, they are natives, and technology is a big thing now, and so like you have to go on with it whether you like it or not." And she takes workshops and she's always like updated about everything."

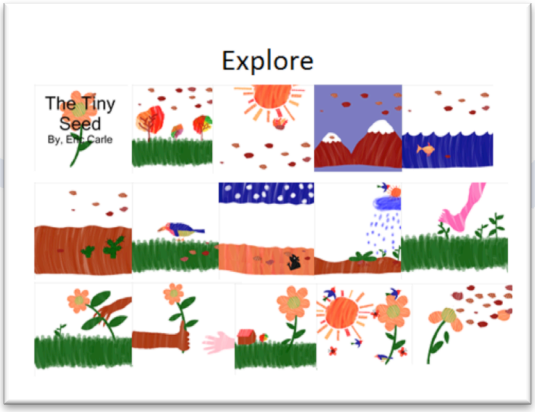
Use of 5E in a sample *Notebook* lesson. The following slides shows what a student has created using the ***Notebook*** software following the 5E framework:

Figure 7



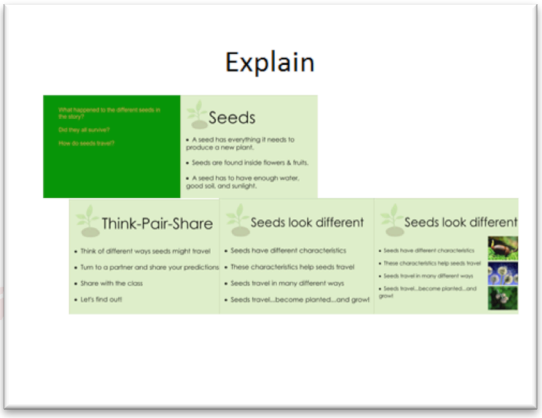
The student participant chose to use a word web to elicit prior knowledge and excite children.

Figure 8



The student participant scanned a picture book into the ***Notebook*** software to read along with the children as they explored the concept of seeds.

Figure 9

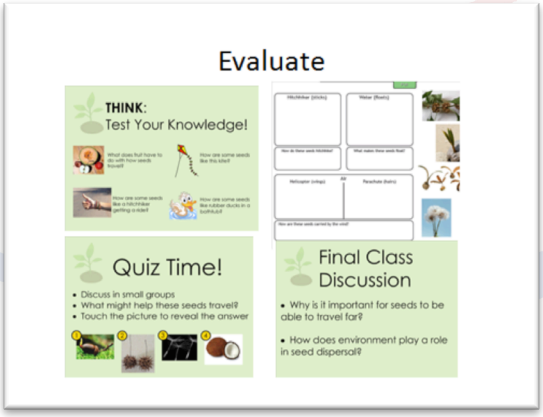


The student participant used various interactive slides to provide opportunities for the children to explain their understandings of these concepts.

Figure 10

The student participant used interactive slides with many opportunities for children to interact to expand upon the concept.

Figure 11



The student participant used interactive slides to evaluate the understanding ofconcepts at various points in the lesson.

Conclusions

Student participants have positive beliefs and attitudes toward technology and its importance and use in the classroom. Furthermore, their general technology skills and their willingness to use them to support teaching and learning is evident. Most of them have basic SMART Board skills but are open to learn the technology. The ***Notebook*** lessons are evidence of the ease with which the student participants are able to not only learn the skills but to apply it effectively within a limited amount of time.

The attitudes and beliefs of the student participants appear to support their understanding and willingness to bridge the gap between the digital natives (students) and the digital immigrants (K-12 veteran teachers).

Future Directions

This study is the initial phase of a series of projects that will be implemented as the School of Education at Adelphi University integrates the use of interactive whiteboards in classroom instruction. For this particular presentation, only the results of the pre-test and focus group responses were shared. Therefore, it will be interesting to see the post-data and focus group discussion at the conclusion of the semester. Further, only a sample of the ***Notebook*** lessons was shared. Therefore, the analysis of the "*Notebook*" lessons and field-based teacher observation forms to determine connections, relationships, and concerns emerging from interactive whiteboard classroom technology use and learning outcomes among P-12 students will be illuminating.

The study is a part of a bigger project that will use the **i^5 framework** in integrating technology in Adelphi University's Teacher Preparation Program. The Individualized Inventory for Integrating Instructional Innovations (i5) was utilized as a framework to guide integration of interactive whiteboard technology to Adelphi University's teacher education program. The framework addresses challenges through identifying potential barriers and seeking solutions as institutions navigate through the process of technology integration. The framework was originated by Groff and Mouza based on a comprehensive review of existing literature. The framework identifies six critical factors, each with each own variables as illustrated in Figure 1: (a) legislative factors, (b) district/school-level factors, (c) factors associated with the teacher, (d) factors associated with the technology-enhanced project, (e) factors associated with the students, and (f) factors inherent to technology itself.

Figure 12: The i[5] Framework

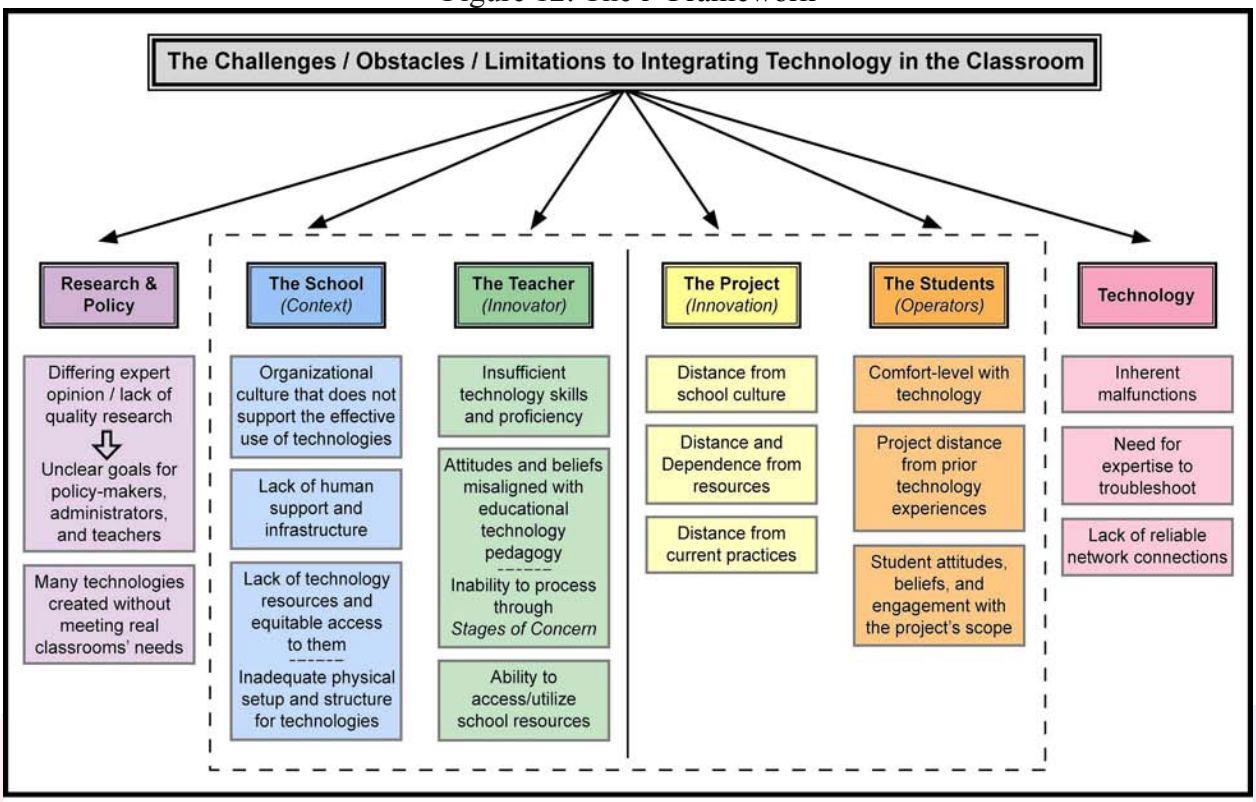


Figure 1. Challenges to Classroom Technology Integration Based on Existing Literature

In this initial phase of the project, the students (operators) of the i5 framework were the focus of the study. The following semester, the focus of the next project will be the teacher (Innovator). As the project moves along, it is hoped that a comprehensive report will be generated that will give helpful insights and concrete strategies about integrating interactive whiteboards in the classrooms, specifically in Teacher Education Programs.

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Integration Technique of Event Progress in Order to Visually Confirm the Connection Between Cases of Accident

Hirotsugu Minowa*[1], Yuya Mizoguchi*[1], Yoshiomi Munesawa*[2]
Kazuhiko Suzuki*[1]

*[1]Okayama University, *[2]Hiroshima Institute of Technology

0425

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Abstract

Preventive measures to prevent the recurrence of the accident, institution, culture, etc. The product is made on the basis of factors that are able to analyze the accident, trends, lessons learned, it is possible to extract the knowledge that leads to the prevention of accidents is a useful. Analysis decipher deeply accidents by experts is mainly for processing power and memory ability of human is difficult, the analysis of the accident the current analysis of the factors that spans between cases, most analysis of cross-sectional case has not been made.

In this paper, we propose a visualization system for the development of accident to visually represent the relationship between accidents. In the description of the accident, it is a system that extracts the progress represented by the unit of principal and predicate, to integrate the flow of the accident by the consolidation of progress. To extract such damage case is large, and progress noteworthy example, and cause and progress should cut off of frequently lead to injury or danger from cases that have been accumulated by linking progress the same, the number of progress is small help me.

In this paper, we will report it to develop a format for recording the progress of events, performance evaluation can be applied to case studies accident RISCAD, progress was confirmed to be able to extract.

1. Introduction

Occurrences of accident and disaster cause the damage significantly to economical effect and human beings and environment because of using hazardous material in the industrial plant such as chemical and nuclear plant. Implementation of measures for disaster prevention and security level improvement is strongly desired.

Fire White Paper "Recent Trends and Current Status on the industrial complex disaster"(Fire and Disaster Management Agency, 2009) was published by Fire and Disaster Management Agency explains that the number of accidents had increased in recent years, but have been decreasing in 2008 and 2009 after peaking in 2007, but the number of accidents was increasing every year after 2008.

The direct cause of the accident occurrence in fiscal 2009 is that the number of human factors on management or manipulation plane surface is 84 (47.5% of the incidence of the total) and the number of physical factors on facility degradation and failure of equipment is 87 (49.2%). The physical factors and human factors account for most of the total in that. It is necessary to prevent accident occurrences because of trend increasing accidents (High-Pressure Gas Safety chamber of Commerce security distribution group of Ministry of Economy and Trade and Industry, 2012) for other industry too. However, there is a problem how to analyze the factors behind the accident is insufficient.

The National Institute of Advanced Industrial Science and Technology enforced the requirements questionnaire about RISCAD (Yuji Wada, 2003) which was constructed by it (AIST, 2008). The questionnaire gets answers from 46(24.2%) of 190 chemical companies. 28 (61%) offices answered question 1 as to have made database individually. 21 (79%) of them has the search function by accident type (fire, explosion, leakage, etc.), and 11 (39%) DB has the search function by process and facilities, and 10 (36%) DB has the search function by material name. The database was found to have remained in the 2-3% degree to have analyzed detail such as understanding cause including the organizational factors by time series.

DB is not utilized enough because the effective usage technique is not to be established. The conventional analysis method is good for reader to understand an accident case in details because the analysis is the technique to decipher deeply. But the analysis between cases has been done only statistical analysis according to the category because analyzing the trends and connection between cases is difficult (Japan Petroleum Energy Center).

However, there is enough room to improve the total technique from collection to analysis of accident cases to realize to permit problem search by logging history of accidents and near-miss accidents. So as we propose an integrated event progress expression method for accident so that it can consolidate the progress of different accidents and express comprehensively.

This progress expression technique has below advantages in addition to as much as possible for the conventional method which enables visualization and sharing of information.

1) Frequency analysis of progress

There are measures to safeguard the progress leading high frequently to the accidents and the near-miss accidents as a way to prevent accidents. That is based on an idea to prevent the accident by blocking the connection of progress because of the accident is lead from series of event progress. However there was no means to calculate statistically progress path whether or not to shut off in the conventional accident analysis. Our technique integrating event progress can remove factors of progress causes the accident statistically by integrating progress of events and analyzing frequency of progress paths. There is an expect to reduce possibility of the accident occurrences by blocking path of progress has more possibility to lead the accident because of for example frequent progress often means that the event progress is occurring frequently. On the other hand, our method is expect to find out the accidents to be prevent because they causes a lot of damage although they are low frequency.

2) Risk prediction by superimposing progress path

Near-miss is an event that did not lead to an accident, it is difficult to say that fully utilized because it is neglected compared to accidents. It is difficult for conventional analysis to determine quantitatively a near-miss leads or not to accident even though it happens high frequent. However if an analyzing near-miss case reveals to have progressed to accident by superimposing the past event progress, we expect that our technique reveals that potential risk has possibility to lead to accidents and makes it easy to implement measures.

Summarize to say that, our method has features to realize trend analysis between many accident cases and to acquire noted case and new knowledge. We aim to realize a tool which can visualize the relationship between cases by integration of the accident cases and which can analyze or learn the factors and trends between cases. This paper explains idea of integration of event progress, and describes the format and the procedure making data to express the integration of event progress, and reports the result of evaluation of method.

2. Progress graph of accident

The progress graph is visualizing accident flow. It has advantage to share by many people and to facilitate the understanding of the accident flow.

The understanding of the accident flow is expected to lead improvement of early response capacity at the time of occurrence abnormality, and to lead to the damage mitigation and accidents prevention. And therefore the progress graph is public at the same time as the accident report to help reader understand the accident flow.

Moreover, it also used in the risk predicting training to respond to the accident recurrence (Naohumi Nakamura, 2011).

3. Expression of accident progress

In conventional expression of accident progress, phenomenon and things are defined as event, accident occurrence is defined as final event. And what one event causes another event is defined as progress. Many methods expressing the accident progress expresses accident flow by connections of progress. Fig. 1 shows an image of expression of accident progress.

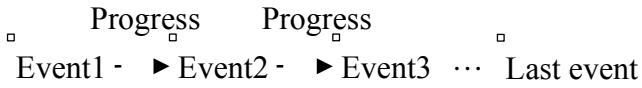

Fig. 1 Relationship between event and progress

4. Presentation of progress

Conventional method displays progress of an accident case as series of events for integrating event progress. This method separates an event to a subject and a predicate and expresses an event using the subject and the predicate. The method expresses progress of events as integrated series events. Subject means subject or object of an event and predicate means action or behavior of the subject. The Integration progress is realized by integrating same the keyword as the smallest unit linguistic words which means the subject or the predicate. Fig. 2 shows mono progress of our method. Fig2 shows an example to show a single progress in this method.

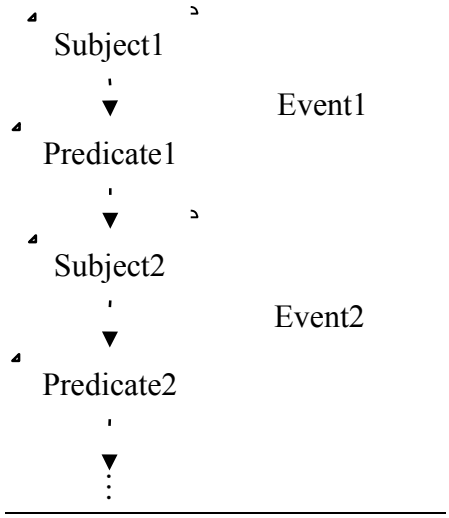

Fig. 2 Our progress displaying method

Progress integration is to integrate subject or predicate in an event with same keyword. The example of progress integration shows Fig. 3. Fig. 3 shows to integrate progress where both predicate1 and predicate2 affects Subject3.

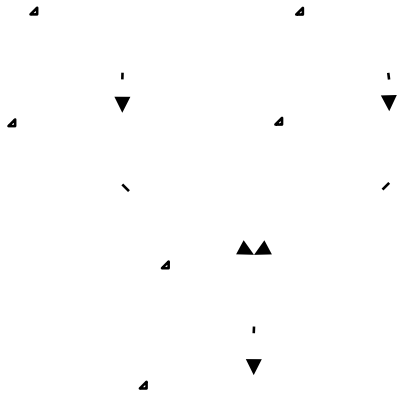

Fig. 3 Example of integrated progress

Branch of progress is one subject and predicate in an event is separated to other subjects or predicates. Example of branch shows Fig. 4. Fig. 4 shows the result of frequency of the branch from predicate1 to subject2 is a%, the result of the branch from predicate1 to subject3 is b%.

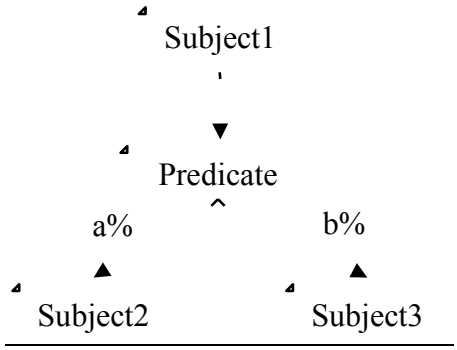

Fig. 4 Example of branched progress

5. DB Schema

5.1 Design Policy

Our data stored format is required to be designed which can store as much information as possible about the accident in order to take advantage of business sites accidents database using this method. To apply stored data as DB is desired to store as much as possible the information of the accident in order to utilize as DB for reader. PFA method which is used in RISCAD also procedures to stores as much as possible the information that can extracted from the information source as accident report. PFA method which is used in RISCAD also takes procedure to amass as much as possible the information that can extract from the information source as accident report. So economical load such as times and costs are desired to be low for making DB.

We propose a DB schema that can store structure of the integrated progress according to above assignments.

5.2 Data groups to integrate progress

To realize our system requires deciding data items using drawing integrated progress graph. There is a difficult problem on extracting data items to make uniform formats because of the formats are different on each accident reports DB. Burdens for operator to input data into format becomes large against policy defined in 5.1 because of complexity to make uniform format is able to apply to DB has different format. Thus we first tried to extract common items which is items exists in different DB commonly and make integrated progress format base on the common items. But it was difficult to define common items definitely because of the difference of format of each accident report DB. To solve the problem, we defined requisite item as items required to draw the integrated graph among items may be exists in different DB. We defined arbitrary item as items except requisite item. The arbitrary item is items which can be added arbitrary because of items reside in different formats of DB are different.

It is possible to apply this integrated approach to draw graph if fill data in requisite item by definition of requisite item and arbitrary item. And the arbitrary item completes lack of integrated progress graph using requisite item data.

Fig. 5 is example shows relationship between the requisite item and the arbitrary item using 3 different formats of accident reports.

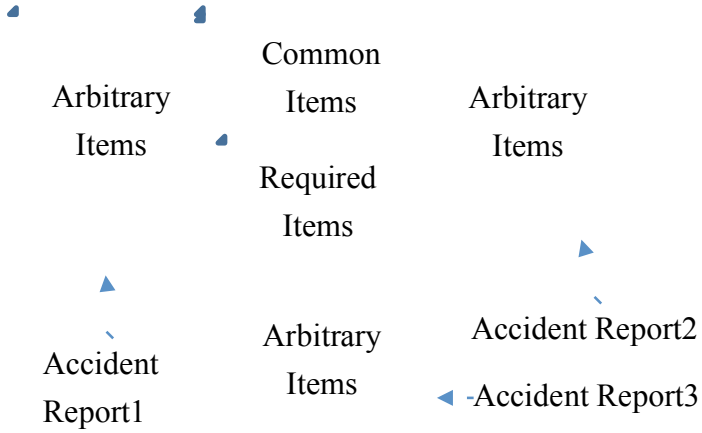

Fig. 5 Image of relationship of items

A) Necessary Item

Necessary items are category has items to make integrated progress event graph. This category has case ID, event ID, progressed event ID, and subject, predicate. Explanation of these items is below.

i.Case ID

This CaseID is id means to identify case uniquely.

ii.Event ID

This EventID is id means to identify event uniquely.

iii.Progress destination ID

The progress destination ID is an id means next d progress event.

iv.Subject

It is keyword means subjective or objective word of such as people, material, equipment and device etc. in the progress event.

v.Predicate

It is keyword means action or predicate of the subject.

B) Arbitrary item

This arbitrary item is item to record descriptions which complements necessary items for people can understand easily in detail.

This arbitrary item had better to make complement items, for example, time and location, reason, behind factor, complement of subjective and predicate etc. The complement of subject and predicate is items to describe as free description for complement because it is difficult for worker to understand subject and predicate of necessary items are keyword to inform necessary of them.

6. Progress sheet

Progress sheet is a sheet to describe extracted items which are defined in chapter 5 to make accident case DB. Our system make integrated progress graph based on the progress sheet. There are columns to describe appropriate extracted items and rows to describe individual progress event in the progress sheet.

7. Procedure to make event progress sheet

Following description is procedure of our method to make event progress sheet.

Step 1 Preparation of analyzing accident cases

There prepares accident reports for analyzing.

Step 2 Decision of arbitrary items

Deciding arbitrary items by referencing B) of 5.2.

Step 3 Confirmation of progress

Unit of progress is a clause which contains one subject and predicate. Extracting individual events back from final event of the accident reports. Marking and confirming individual event contains one predicate and subject.

Characteristic of Japanese language may drop subject. To find principals from the previous description of relevant location Principals for the predicate based on the context of the Japanese at that time.

Step 4 Describing of required items

This step extracts require items by following below at Step 4-1~Step 4-3.

Step 4-1 Describing of capital and predicate

This step describes the subjective and the predicate in individual events which were confirmed on Step 3 to progress sheet in order of events forward from the final event.

The way of extracting capital and predicate is extracting only words which have central means. Confirmation of that extracted words were list up in keyword table. If exact matched keywords are existed, the matched keywords must be applied to subjective and predicate. If similar extracted words are existed, these words integrated into keywords. If there are no matched words, new keyword is registered to keyword list.

Step 4-2 Describing Event ID

This step describes Event ID into a record with the subjective and the predicate which were extracted in Step 4-1.

Step 4-3 Describing progress destination ID

This step describes progress destination ID based on events before Step 4-2 to progress sheet.

If there are record which progress destination ID is blank and has correspond record described, the progress destination ID column is input id correspond Event ID. Progress destination ID of final event should be blank because final event has no next event to progress. If parallel progress is, their progress destination ID should be same progress destination ID.

Step 5 Input arbitrary items

This step extracts and inputs arbitrary items.

If there are descriptions which correspond with the arbitrary items decided in Step 2, the descriptions are extracted and input to progress sheet.

Step 6 Determination of the end of analysis

If there is no event to extract, this analysis finished. On the other hand, if there remains event to be extracted, analysis goes back to Step4.

8. Evaluation experiment

8.1 Evaluation method

This paper described that our method requires accuracy and ease and completeness to utilize as accident case database. This evaluation evaluated about completeness and accuracy. On the other hand easiness is difficult to evaluate because it depends on the subjective. Subjective evaluation of author felt it has easiness for worker to analyze.

8.2 Evaluation reports

Evaluation experiment was applied to accident reports which were selected from RISCAD.

8.3 Comparison of completeness

To evaluate whether coverage of relationship between accident cases which made by experts is complete or not. This evaluation compared with the number of nouns and verbs on requisite word and arbitrary word after extracting nouns and verbs of description of analyzing accident cases. The reason evaluated by words of noun and verb is that they are the words of part of speech necessary to explain events and

progresses.

8.3.1 Evaluation procedure

This section shows the result of comparison with nouns and verbs which were applied morphological analyzer MeCab (Taku Kudo, 2004) to before and after writing of 5 reports of RISCAD.

Table 1 Extraction rate of RISCAD

Report No	Based writing		Extracted writing		Extraction rate [%]	
-	Noun	Verb	Noun	Verb	Noun	Verb
7364	92	9	66	1	71.8	11.1
7666	195	25	117	18	60	72
7720	104	12	62	8	59.6	66.7
7721	47	2	24	0	51.1	0
7722	95	16	41	8	43.2	50
Total	533	64	310	35	57.2	39.6

8.3.2 **Discussion**

Result of accuracy evaluation was confirmed to be extracted with keep relationship of progress by visually. Completeness of word of the major part of speech by applying our method to 5 reports in RISCAD was 57.2% in noun and 39.6% in verb and total was 57.8% which were calculated from extracted words where there were 310 nouns and 35 verbs from base reports and 533 nouns and 64 verbs after analysis.

Content of the verb and noun is different from before and after the analysis is the reason why words indicating the flow were omitted and elaboration of the description when word extraction.

9. Conclusion

This paper reported our proposal of integrated progress method to analysis between accidents. In this paper, we proposed out method to extract data for integration of accident progress. Evaluation experiment reveals that there is no problem in reality and ease, accuracy in evaluating result of applied to 5 cases on RISCAD.

Our method is required to systemize because the result is difficult to display of integrated event progress inevitably is too wider than conventional method. Thus we developed prototype system integrated event progress. Our system was confirmed to

be realized as of Fig. 6 showed a part of our system.

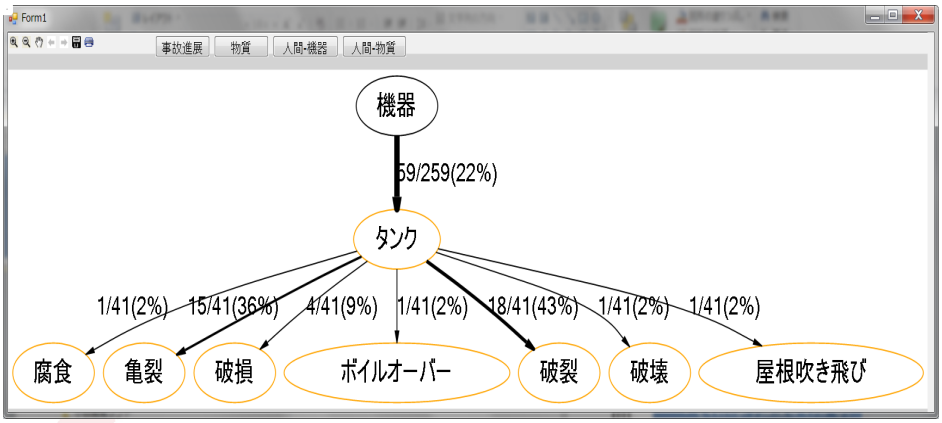

Fig. 6 Output of integrated event progress

Reference

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Using Member Only Wiki Space for Collaborative Writing and Peer Interaction in the Undergraduate EAP Course

Yaoko Matsuoka

International Christian University, Japan

0432

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Abstract

The use of technology in language learning and teaching has become increasingly important during the past several decades, and effective application of CMC (computer mediated communication) to the English curriculum has permeated in higher education in Japan. This paper reports on an attempt of applying wiki writing to second-year undergraduate EAP (English for Academic Purposes) course at a national university in Japan and reflects on its benefits and deficiencies, aiming at future pedagogical improvement. To promote critical thinking and academic writing skills, collaborative writing using wiki technology was incorporated into a 15-lesson semester course through WebClass, an integrated e-learning program. Students worked in small groups cooperatively to create a passage for assigned topics. Though each wiki space was arranged for the use of group members only and not accessible by other groups during the writing phase, a teacher was able to observe the developmental process of writing to check the progress. Wiki writing activity seems to be useful from the perspectives of sociocultural theory and interaction hypothesis in that it facilitated collaborative writing by offering the environment where peer comments and more competent students' written text served as 'scaffolding' to improvement, and peer interaction was promoted. Appropriateness of the CM-based wiki writing activity was evaluated out of consideration for Instructional Design perspectives, using Simplified Motivational Design (Keller and Suzuki, 1996). In addition, results from 'jugyo hyouka', a questionnaire conducted by the university, indicate a certain degree of satisfaction of students concerning the use of wiki.
Keywords: *wiki, collaborative writing, EFL, EAP, interaction, communication, LMS*

1. Introduction

The use of technology in language learning and teaching has become increasingly important during the past several decades, and effective application of computer mediated communication (CMC) or information and communication technologies (ICT) to the English language learning curriculum has permeated in higher education in Japan. Recent Web 2.0 technology provides various web-based applications for interactive communication, such as discussion forum, oral and written chat, and wiki. Wiki is known as "a web-based software that allows all viewers of a page to change the content by editing a page on line in a browser", and this makes wiki "a simple and easy-to-use platform for cooperative work on text and hypertext" (Ebersbach, Glaser, Heigl, & Warta, 2008). Collaborative writing can be defined as "the joint production or the coauthoring of a text by two or more writers" (Storch, 2011, pp275), and in this respect, writing tasks using wiki may appropriately support collaborative writing. Use of the collaborative writing is quite common in university L2 courses (Storch, 2011) and provides students benefits such as fostering reflective thinking and greater awareness and understanding audience (Bruffee, 1933; Storch, 2011). Though there exist relatively few studies on wiki, applicability and usefulness of wikis in language classrooms have been actively investigated with positive results in recent research (e.g., Bradley, Lindstrom, & Rystedt, 2010; Lin and Yang's, 2011). The L2 writing with CMC tools, as Felix's (2005) meta-analysis shows, seems to have effects as: increased participation, positive attitude and empowerment of students, decreased teacher control, wider variety of discourse functions, and mixed results regarding syntactic complexity.

This paper reports on an attempt of applying wiki writing via the learning management systems (LMS) platform called Webclass to second-year undergraduate EAP course at a national university of science and technology in Japan. LMS is an integrated e-learning system that provides teachers and students opportunities to use a variety of applications easily and meaningfully both inside and outside of the classroom. LMSs are excellent for both individual and group-based communicative tasks, for instance, collaborative learning, bulletin boards discussion, chat, and Web-conferencing (Latchem & Jung, 2010). The target course involved three classes with totally 108 students from the Department of informatics and engineering. This course can be labeled as EAP (English for academic purposes) rather than EFL/ESL (English as a foreign/second language), since the main objectives of the course are to develop students' academic study skills (e.g., listening, note-taking, reading, and academic writing) and higher order thinking (e.g., summarizing, critical thinking, and discussing) so that they can be well-prepared for the science-and-engineering specific ESP (English for specific purposes) courses that will be offered in their third academic year. In particular, the two most important elements of this course were academic writing and academic presentation, for which students were asked to work in small groups. Wiki was selected for the group-based writing, while forum was also incorporated to the weekly opinion-exchange activity. The present paper also reflects on the benefits and deficiencies of the course design, aiming at future pedagogical improvement.

2. Background: CMC, LMS, and L2 Instruction

Recent research indicates that the use of CMC facilitates L2 learning and teaching (e.g., Grosbois, 2011,on oral output and phonological development; Kenning, 2010, on synchronous CMC; Yu & Zeng, 2011, on collaborative dialogue interaction).

Computer programs have advantages that it can be used to develop any of the four skills of language learning and has a scope of learner control, and these strengths are available when the media are designed carefully and applied to instruction appropriately (Moore & Kearsley, 2005). Blake (2011) suggests that students who took all or part of their classes online seem to have performed better than those in traditional face-to-face learning environments, and students involved in blended or hybrid learning environments, where courses are provided both in face-to face and on-line, did better than those in purely online courses.

In formal educational settings, computer program or web-based learning system has developed remarkably since the computer mediation (CM) became available in the late 1990s. CMC tools such as computers connected to the internet, i-pad, and mobile-phones have been applied to language activities. In particular, in higher education, increasing pervasiveness of LMS, e.g., Blackboard, WebCT, eClassroom, Moodle, FirstClass and Webclass, enabled many students and teachers to access both types of on-line communication: *synchronous* (interactive communication with no time delay; e.g., written and oral chat) and *asynchronous* (communication with a delay that allows participants to respond at a different time after the message is sent; e-mail and on-line forum) (Moore & Kearsley, 2005). The LMSs provide the capabilities for the both types of communications, in addition to the learner management resources, testing functions, and access to a huge reservoir of Web resource materials (Moore & Kearsley, 2005). That is, integrated computer program is valuable in that it has functions as presentation of information, documentation and storage of data, and provides learners with online learning community.

3. Research on Wiki

Since Ward Cunningham created the first wiki in 1995, a considerable number of wiki pages have been created on the web, and application of wiki to language education has attracted interests of teachers and practitioners. There have been, however, relatively few empirical studies that applying wikis to language learning environment to improve students' interaction. Primary focus of the research relating to the use of wiki has been on the effects of collaborative work of students, especially with writing tasks and students' interaction in the process of collaborative writing.

Study on the rationalities of collaboration for a wiki-based writing by Bradley, Lindstrom, & Rystedt (2010) investigated students' written communication displayed in the wiki environment. It is reported that a variety of aspects of collaboration and cooperation are seen in majority of the groups: for instance, the level of collaboration in writing varies from mostly no visible interaction to high level of collaboration; students are giving feedback each other in peer groups as well as between groups when creating a text. Interestingly, however, they found that in some of the groups, members were contributing to their joint text by posting a full piece of text as individuals, showing no collaboration.

Applying wiki technology and peer review to an EFL writing class was also reported by Lin and Yang (2011). They explored the college sophomore students' perception about integrating the use of wikis and peer feedback in Taiwan. The results from the responses of a survey and student/group interviews indicate the significant social meaning in wiki writing project and the mitigation of instructor's authority as perceived benefits. It was reported that students seemed to have learned much from

reading the text produced by peers, for example, concerning other's mistakes in vocabulary, spelling, and sentence structures. At the same time, the challenges of wiki writing project were also shown in Lin and Yang's (2011) study. They pointed out students' perceived functional obstacles (e.g., unfamiliarity with the wiki interface) and psychological obstacles (e.g., hesitation to correct other's mistakes) to using the wiki writing tool, suggesting the need of the training of peer feedback.

Synchronous aspects of wikis have attracted the interests of researchers and practitioners. A collection of case studies on wikis by Bruen, Fitzpatrick, Gormley, Harvey, and McAvinia (2010) have illustrated how the use of wikis supported the learning in various educational and institutional contexts. All the case studies have clear purpose to use wiki and admit that the use of wiki supports face to face meetings. It is conclusively suggested that wikis not only support but also activate community activity, afford knowledge creation, and "support knowledge management in complex collaborative projects" (Bruen, Fitzpatrick, Gormley, Harvey, and McAvinia, 2010, p. 110).

4. Theoretical Frameworks: Interaction Hypothesis and Sociocultural Theory

CMC plays a significant role in ESL/ EFL learning and teaching by providing the situation that facilitates learners' interaction with appropriate use of a target language. The web-based interaction, either synchronous or asynchronous, provides learners with 'on-line or virtual community' (Moore & Kearsley, 2005). Previous studies on wikis have employed various theoretical frameworks to account for the feasibility and effectiveness of wiki technology application. Interaction Hypothesis and Sociocultural Theory are the two most frequently used principles of second language acquisition (SLA) to promote on-line interaction. The benefit of interacting with others is described in *Interaction hypothesis* initially proposed by Long (1981). The hypothesis refers to the idea that language acquisition requires or greatly benefits from interaction, communication, and especially negotiation of meaning, which happens when interlocutors attempt to overcome problems in conveying their meaning, resulting in both additional input and useful feedback on the learner's own production (Richards & Schmidt, 1985). In the *Interaction Hypothesis*, Long (1981) proposes that, for successful second language acquisition, more attention should be put on the *interactions* which learners engage in, rather than merely depending on *input* and *output*. *Input* refers to the linguistic forms used, while *interaction* means the functions served by those forms, such as expansion, repetition, and clarification, and these interactions are not only a source of L2 input, but are rather exchanges in which the participants negotiate the meaning of the input. This negotiation results in changes to the quality and complexity of the *input*, which promotes L2 learning. Thus, interaction can have positive effects on L2 development, though it should not be seen solely as a cause of acquisition (Fang, 2010).

Learning is potentially a social process in which learners acquire knowledge and understand the nature of things through interaction with others (Vygotsky, 1978). Vygotsky's (1978) renowned concept, *the zone of proximal development* (ZPD), refers to "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (pp.86), and this support of more capable others is called 'scaffolding'. The principle of ZPD has had considerable impact on recent pedagogical research and

instructional design of SLA (e.g., Ohta, 2005; Lantolf, 2000; Takahashi, 2001, Samuda, 2001). Applying Vygotsky's *sociocultural theory* to formal EFL education in Japanese universities, Shinjo (2008) has attempted to clarify one aspect of 'learning' by seeing it not as an individual activity but as a conversational and communicative activities based on interaction with others. In this respect, learning can be supported by different types of mediation, for instance, psychological tool such as language and codes, and technological tool such as a computer. As Shinjo (2008) argues, it seems significant to examine the use of computers or ICT from the view point that sees them as useful tools to mediate interaction between learners in building a learning environment, rather than the view point that sees them merely technological tools for transmitting information. It might not be too much to say that to investigate how language are learned in ZPD may lead us to "move toward a more holistic and process-oriented view of what it means to acquire a language"(Ohta, 2005, pp.515)

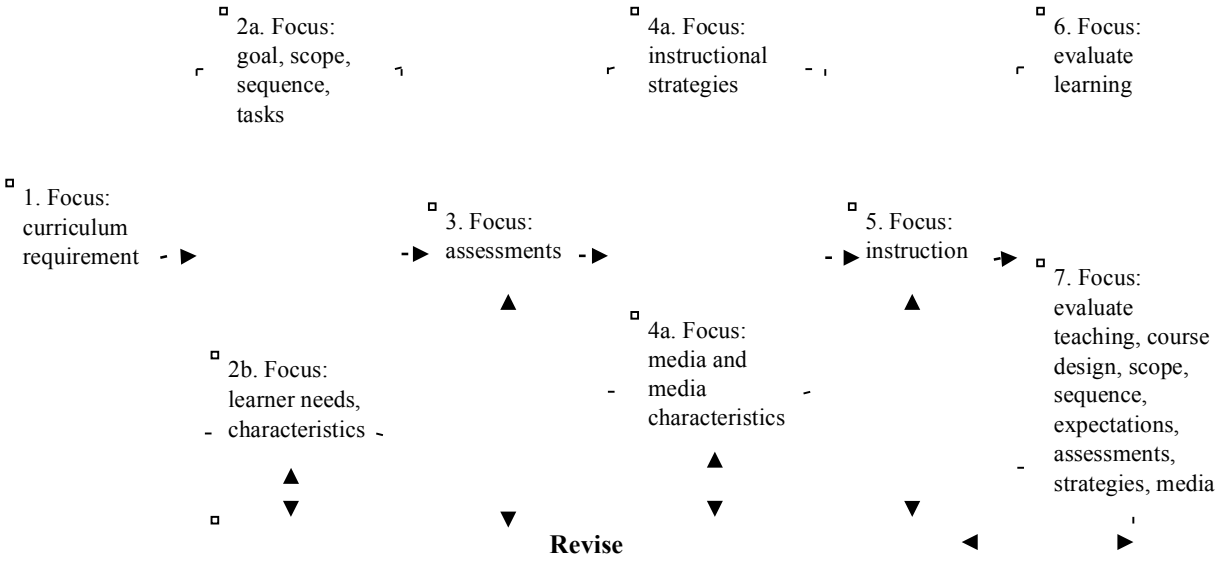
Presence of the sense of community in web-based instruction is also examined in Ko's (2012) study of *social presence* in French language learners' learning environment including the use of video/audio, audio, and face-to-face communication. Due to the fact that web-based learning embodies the nature of '*community*' when tasks and activities are utilized interactively in second language instruction, *sociocultural theory* (Vygotsky, 1978) seems to be strong underpinnings of the on-line-based interaction.

5. The Wiki Application

5.1. *Blended Course Design*

The fundamental objective of the target EAP course was to develop the skills of critical thinking, academic writing, and academic presentation based on acquisition of global knowledge through the news articles and videos. The course was designed as the blended learning style, which combines face-to-face instruction and web-based activities together. Blended learning has advantages that it can extend time and task of traditional face-to-face instruction, promote the opportunities of cooperative group activities, and realize easier adjustment to e-learning than adopting fully on-line courses (Garrison, 2011). *A modified instructional design model for teacher-designers* by Rogers (2002) was helpful in designing this blended-course (see Table 1). The model seems to be easy to use for teacher-designers in many respects, especially because it offers quite practical ways of designing courses in real educational contexts and fits the course design that employs technological media. It provides seven steps of design elements, starting with the focus on (1) institutional curriculum requirements, and focusing respectively on (2) goals of learning and learners and learner needs; on (3) assessments; on (4) teaching strategies and instructional media use; on (5) instruction itself; on (6) evaluation of
student gains and (7) evaluation of teaching and the entire course (Rogers, 2002). In addition, it is encouraged in this model to revise every element at any stage of designing the course. The steps are shown in Figure-1.

Figure-1 : A Modified Instructional Design Model For Teacher-Designers by Rogers (2002).



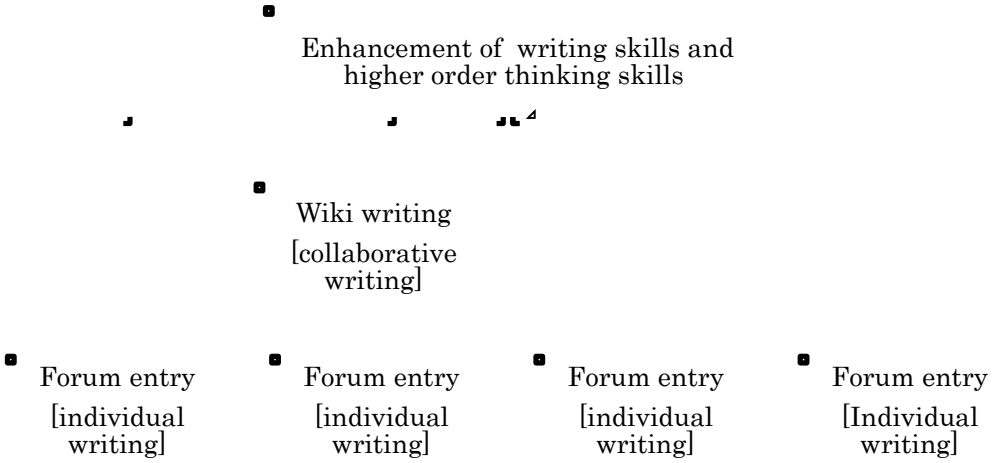
Applying Rogers' model, the course was organized under the institutional requirement of genre-based pedagogy (e.g., Swales, 1990), setting the goal as development of writing and presentation skills, and selecting topic contents with consideration to the needs and characteristics of science-and-technology majoring students. Accordingly, a student's argumentative writing, the final product of academic writing activities, and its presentation were included in the assessment stage. Selecting instructional strategies was intertwined with the selection of media. Under the premise that Webclass LMS would be used, wiki and forum were chosen from the three options of interactive function of Webclass, since it was assumed the third option, chat, would be hard to implement due to the limited class time, predicted difficulty in time management and a relatively big size of class. In the fifth stage, instruction was considered and revised in relation to other elements.

In this blended course, wiki writing was implemented on the LMS environment called Webclass, which was developed and operated by the university where the target EAP course was taught. The use of this institutional LMS helped students overcome administrative issues such as creation of new accounts and security problems and provided a safer and more familiar e- learning environment than other free open soft-wares. A course textbook titled ABC World News 14 (Kinseido, 2012) was adopted to provide students with a wide range of information through texts, CD, and DVD, all of which offered students with valuable resources for global, social, and scientific knowledge and information, and other authentic L2 input through news contents in English. Two different writing activities were designed to enhance students' academic writing skills: collaborative writing on assigned topics using the wiki spaces and individual writing of a short paper on the topic selected. Both writings were to be presented as a group presentation with a power-point slide in front of the classroom.

Besides them, students were encouraged to enter comments in weekly discussion forums to present their opinions and thoughts about the issues they studied in class.

Consequently, each student had to create one wiki text cooperatively in a group in addition to entering comments in the forums as an individual. The two types of on-line writing activities in the blended course is visually presented in Figure-2.

Figure 2: Visualization of wiki writing and forum entry in a blended course design



5.2. ***ARCS Model and Simplified Approach***

While Rogers' ID model offered systematic, teacher-designer-friendly assistance to designing the course, final evaluation of the course design (and decision making in some part of the design process) was done following the concepts of Keller's ARCS Model of motivational design. ARCS stands for Attention (capturing the interest of learners; stimulating the curiosity to learn), Relevance (meeting the personal needs/goals of the learner to effect a positive attitude), Confidence (helping the learners believe/feel that they will succeed and control their success), and Satisfaction (reinforcing accomplishment with internal and external rewards) (Keller, 2010). The model was first to have focused on the affective domain of instructional design and provided instructional designers a systematic process of incorporating motivation to the instructional systems design (ISD) (Shellnut, Knowlton, and Savage, 1999). According
to Keller (2010), it is not sufficient for designing instruction to focus only on processes and techniques for producing efficient and effective instruction as the traditional view of instructional design used to do, but it is important to consider how to make instruction appealing; appealing without becoming purely entertaining. This time, Simplified Motivational Design Process Matrix (Suzuki & Keller, 1996) was employed to evaluate the course. While the original ARCS Model proposes ten steps for motivational design process, Simplified Motivational Design Process Matrix provides much simpler process involving fewer four design factors: learner characteristics, learning task, medium, and courseware characteristics. The matrix also has spaces for a teacher to fill in by considering a summary of those design factors and motivational tactics for the lessons.

5.3. *Students' Perception*

5.3.1. University-oriented questionnaire

Though this attempt was reviewed based on the teacher's (author's) reflection and evaluation, students' perception of the instructional effects was also grasped through the 'Jugyo hyouka', a questionnaire conducted to the students by the university's educational affairs at the end of every term in order to evaluate instructional effects of each course. The same questionnaires were conducted to all the courses, and their results were to be opened to each teacher and university faculty members. Following the questionnaire guideline that suggests teachers to add more questions if necessary, four simple questions concerning the use of wiki and *Webclass* were added to the list of my course. The simple questions include:

1. Was the use of Web Class effective for your English study?
2. Was the use of wiki effective for the group writing for the project?
3. Was the use of Discussion Forum effective for your English study?
4. Do you think understanding other people's opinion through on-line writing is useful in improving your critical thinking skill?

Respondents' levels of agreement to the questions were presented in five items of Likert

Scale: strongly agree, agree, not decided, disagree, and strongly disagree.

5.3.2. *Student Perception about the use of LMS, wiki, and forum*

According to the University's official report on the questionnaire results sent to me after

2012 spring semester, following results were indicated. As shown in Table-2 below, about 65.5 % of students think that Webclass LMS was used effectively in the course, and 17.8 % of them selected *Not Decided*, though 8.8 % showed disagreement and 1% showed strong disagreement about the LMS effectiveness. In terms of the effectiveness of wiki in group writing activity, totally 65.2% (32.2% of strong agreement and 33% of agreement about its effectiveness) admitted that the use of wiki was effective. The figure far outstripped that of forum, which was 56.2% in total with 17.1% of strong agreement and 39.8% of agreement. For the question about the acquisition of critical thinking skills, nearly 29 % answered that on-line writing, where they were able to understand other students' opinions, was effective in promoting critical thinking skills.

Though there were approximately 17 to 29% of people who did not make their decision, quite a few people, 0.9 to 8.8%, expressed their disagreement and few, mostly below 1%, showed strong disagreement concerning the use of Webclass LMS, wiki, and forum, and the development of critical thinking.

Table-2 Results of the University's Questionnaire

	SA	A	N	D	SD
LMS effectiveness (%)	27.8	37.7	17.8	8.8	1.0
Wiki effectiveness	32.2	33.0	20.0	6.9	0.9
Forum effectiveness	17.1	39.8	29.2	5.0	0.9
Critical thinking skill gained	28.9	34.1	28.0	0.9	0.9

[Scale: SA: strongly agree, A: agree, N:not decided, D:disagree, SD: strongly disagree.]

6. Reflection and Discussion

The web-based interaction, either synchronous or asynchronous, provides learners with 'on-line or virtual community' (Moore & Kearsley, 2005), and the blended learning style often seems to be more appropriate in Asian contexts (Latchem and Jung, 2010). The attempt of applying online writing tool to EAP course was reviewed based on the teacher's (author's) reflection on how wiki technology played a significant role on the development of students' collaborative writing. The course was designed using *a modified instructional design model for teacher-designers* by Rogers (2002). In the final evaluation stage, Simplified Motivational Design Process Matrix developed by Suzuki & Keller (1996) was used to evaluate the course by analyzing design factors: learner characteristics, learning task, medium, and courseware characteristics (see Appendix-1). By putting the + (positive) and－(negative) signs to the ARCS categories respectively from factor to factor, it was found that wiki was applied to a large extent effectively to the blended course design. For instance, in respect of Attention, the section of learner characteristics has one (+) (learners' attention is high because it is part of the course requirement) and one (-) (learner's attention is not high because additional time and effort are needed for the wiki task). To sum up, learners afford characteristics suitable to utilize the wiki technology but their lack of confidence in English writing might hinder smooth implementation of collaborative editing. To sustain *attention*, it is needed to emphasize the effect of longer exposure to the target language and try to include new sources as much as possible. A high degree of *relevance* was shown, as collaborative writing task seems to fit one of the course objectives to improve writing skills. It was also found that while the course design enabled learners to be *confident* to use the system, anxiety for the unstable connection or faults of system cannot be completely discarded, suggesting the importance of face-to-face instruction. As for *satisfaction*, increasing exposure to English and sense of task involvement seem to lead to positive perception of learners. Prominently, it was observed that few students corrected other member's mistakes in language and structure, and no one deleted sentences others had written. When editing the passage, students acted very carefully not to change the sentences written by other people, and tended to express an excuse in Japanese when they had to edit or modify the sentences already written.

The importance of interaction should not be overlooked in language instruction. In this attempt, collaborative writing using wiki technology was incorporated into the course activities as part of the blended course design. Wiki facilitated collaboration by constructing safe spaces (Howard, C. D., 2012). The results from the university-oriented questionnaire including additional questions indicate a certain degree of satisfaction of students involved in the targeted EFL course I was teaching. As for future improvement of course implementation, it would be suggested that more opportunities to apply CMC tools could be provided in foreign and second language learning. In the use of technology in language learning classrooms, the focus of the research has recently begun shifting from on the efficacy and effectiveness of transmitting learners information to on the communicative and interactional effects of on-line community. Though the conveyance, processing, and storage of information are still the prominent features of CMC, it would be of benefit to examine how the use of these technologies promote individual learner's spontaneous learning and development in knowledge acquisition. Using CMC technology as a pedagogical tool seems to have significant advantage in instruction: to provide broadened discourse

options and opportunities for performance and practice in meaningful interactions (Belts, 2007).

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Appendix-1: Simplified Motivational Design Matrix for Wiki application in EAP Course

Based on Suzuki & Keller, 1996

Design Factors	ARCS Categories			
	Attention	**Relevance**	**Confidence**	**Satisfaction**
1.Learner Characteristics	▪Part of a required course (+) ▪Additional time /efforts are needed (-)	▪ Experience of using the same tool for other subjects(+) ▪ interest/desire to improve writing (+)	▪Unconfident in writing English(-) ▪Have knowledge of digital devices/ source (+) ▪be fond of online-communication (+)	▪Get more information (+) ▪Understand course contents(+) ▪Access possible at home (+)
2.Learning Task (Wiki writing)	▪Similar to (+) (-) ▪Additional/ new contents (+) ▪New task (+)	▪Relevant topics (+) ▪Contain up-to-date materials (+) ▪Fit the course goal (+)	▪Collaboration (+) ▪Become able to write a longer passage (+) ▪Unconfident writing (-) ▪Peer support available (+)	▪Increasing exposure to English (+) ▪Sense of involvement (+) (-)
3.Medium (computer/ cellphone)	▪Not a new medium (-) ▪Accessible on cell-phones (+)	▪Widely used medium (+) ▪Convenience to present digital data/ information (+)	▪Possibility of unstable connection (-) ▪Familiar with using a computer (+)	▪Effects of asynchronous communication (+)(-)
4.Courseware Characteristics (LMS)	▪Already familiar with the system (+)	▪Developed for educational purposes (+) ▪Pervasiveness of e-learning tools (+)	▪Familiar with its operation (+) ▪A certain degree of trust to the system (+)	▪Share opinion/ materials with others(+) (-)
5.Summary	Greater attention	Minimal tactics required	Minimal tactics required	Support learners to build satisfaction
6. Motivational Tactics for the Lesson	▪Emphasize the effect of longer exposure to the target language. ▪Include new sources as much as possible.	▪Give feedback or talk about it sometimes in class	▪Support on-line failure (e.g., by allowing paper-based submission; provide user manual)	▪Encourage and support interaction through wiki/ forum

Exploring Learner's Satisfaction and Adopting Intention toward Task-Technology-Fit Theory in Gesture-based Learning System for Computer Assisted Circuit Learning

Sheng-Wen Hsieh*[1], Shu-Chun Ho*[2], Ci-Yuan Ni*[2]

*[1]Far East University, Taiwan, *[2]National Kaohsiung Normal University, Taiwan

0435

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Abstract

Gesture-based learning with Kinect will increase the learning activities performance by adding simulation interaction and situational action element. The aim of this paper is to develop a gesture-based learning system, allowing users to use skeletal tracking to capture the body movements, enabling learners to control and interact with the computer without any intermediary controller while learning circuit course, and adopting Task-Technology-Fit theory to explore and discuss the learner's satisfaction and intention. Based on 30 valid samples and data analysis, this paper found that learners' awareness, task characteristic, technology characteristic and personal characteristic were highly related to task-technology fit. Furthermore, task-technology fit also significantly affected learner's satisfaction and their adopting intention of the gesture-based learning system.

Keywords: *Gesture-based learning, Task-Technology Fit theory, Embodied Interaction, circuit course*

1. Introduction

The advancement of human computer interaction technologies has offered an opportunity for providing support for learning activities with digitalized supplementary materials. On the user interface design, Natural User Interface (NUI), that is based on gesture and voice-based interface. For example, Kinect is a motion sensing input device. The device comes with an RGB camera, a depth sensor, and array of microphones, which in combination provide full-body 3D motion capture capabilities and gesture recognition. It enables users to control and interact with the game console without the need to touch a game controller, through a natural user interface using gestures and voice (Dutta 2012). Recently, the Kinect sensor is also widely applied to many professional areas of applications including medicine, entertainment, education, and many others (Kean et al. 2011). For example, using a Kinect and commodity graphics hardware, Richard et al. (2011) presented a system for accurate real-time mapping of complex and arbitrary indoor scenes. Weise et al. (2011) further captured and tracked the facial expression dynamics of the users in real-time and map them to a digital character.

The appearance of Kinect certainly draws the attention of educators and encourages the evaluation of its feasibility in education (Hsu 2011). However, the current experiments and developments with Kinect are still in a primitive stage, it lack of proper strategies or tools to assist the students to learn. Researchers are not clear about how kinesthetic interactions can enhance learning. Therefore, a gesture-based learning system for computer assisted circuit learning approach is proposed in this research to address the question of how task–technology fit influences the performance impacts of the gesture-based learning system. We use Task-Technology-Fit theory for base to explore the use of the gesture-based learning system, to discuss the user satisfaction and adopting intention through the result of this study. The primary research question investigated in this study was

(1) Does learners' task characteristic, task characteristic, technology characteristic and personal characteristic impact task-technology fit of the gesture-based learning system?
(2) Does task-technology fit also impact learner's satisfaction and their adopting intention of the gesture-based learning system?
(3) Does learner's satisfaction impact their adopting intention of the gesture-based learning system?

2. Literature Review

2.1 Gesture-Based Technology

Gesture-based learning have particularities, because users interact in the learning process through the actual way, just like they interact in the nondigital world. Gesture-based computing can be viewed as an innovative educational development in alignment with bodily-kinesthetic intelligence. It also can support kinesthetic pedagogical practices to benefit users with strong bodily-kinesthetic intelligence. It involves devices controlled by natural movements of the finger, hand, arm, and body (Johnson et al. 2010). The Microsoft Kinect Sensor is a 3D scene-capturing device developed by PrimeSense company in collaboration with Microsoft, introduced in

2010. The Kinect sensor was initially sold as a gaming accessory for Microsoft Xbox game console and its main purpose was offering a new and revolutionary way of interacting with games. Kinect enables users to control and interact with the game console without the need to touch a game controller, through a natural user interface using gestures and voice commands (Dutta 2012).

All the scholars emphasize the technical innovation with Kinect applied to educational assistance. As Hsu (2011) indicates, its kinesthetic features and gesture-based interaction surely will encourage educators to devote themselves to kinesthetic pedagogical practices in the classroom instruction. Nowadays, the gesture-based technology is applied in divergent realms. For example, Chang et al. (2011) use a Kinect-based system to assess the possibility of rehabilitating two young adults with motor impairments. Data showed that the two participants significantly increased their motivation for physical rehabilitation, thus improving exercise performance during the intervention phases. Chang et al. (2011) use a Kinect-based task prompting system to assess the possibility of training two individuals with cognitive impairments, the result have shown that the two participants significantly increased their target response, thus improving vocational job skills during the intervention phases. Tong et al. (2012) using Kinect scanning 3D full human bodies, the experimental results have shown the efficiency and applicability of the system. Chiang et al. (2012) using Kinect to explore health benefits in somatosensory video games, Xbox 360 Kinect, on institutionalized older adults with wheelchairs. The study concluded that Xbox 360 Kinect is a potential tool to improve visual performance skills for the institutionalized elderly with wheelchairs.

However, the current experiments and developments with Kinect are also still in a primitive stage. If Kinect comes with software for teachers to design the control over computers, it would surely become a powerful interactive educational technology (Hsu 2011). Consequently, we develop a gesture-based learning system, allowing users to use skeletal tracking to capture the body movements, enabling learners to control and interact with the computer without any intermediary controller while learning circuit course.

2.2 Task–technology fit

Goodhue & Thompson (1995) proposed that an explanation of information systems success needs to recognize both the task for which the technology is used and the fit between the task and the technology. As Goodhue & Thompson (1995) defines, task–technology fit meant the degree to which a technology assists an individual in performing his or her portfolio of tasks. They developed the technology-to-performance chain (TPC) as a model to help users and organizations understand and make more effective use of IT. The model proposes that task–technology fit is a function of task characteristics, technology characteristics, and individual characteristics. Task–technology fit in turn both directly influences performance, and indirectly influences utilization via precursors of utilization such as expected consequences of use, attitude towards use, social norms, habit and facilitating conditions. Utilization is also proposed to directly influence performance. The basic argument is that for a technology to have a positive impact on individual performance, the technology must fit with the tasks it is supposed to support, and it has to be used.

Other realms in which parts of the model have been tested include software development (Dishaw & Strong, 1998), managerial decision making (Goodhuez et al. 2000) and health care (Pendharkar et al. 2001). The most comprehensive test of the model to date is Staples & Seddon's (2004) study which considered use of a library cataloguing system by staff and use of spreadsheet and word processing software by students. The result have shown that TTF in the performance of use, the beliefs of use and attitudes have a significant impact. However, the role of task–technology fit has not yet been investigated in the e-learning realms. In this study, we adopting Task-Technology-Fit theory to explore and discuss the learner's satisfaction and intention of the gesture-based learning system. Figure 1 shows the Model tested in the study.

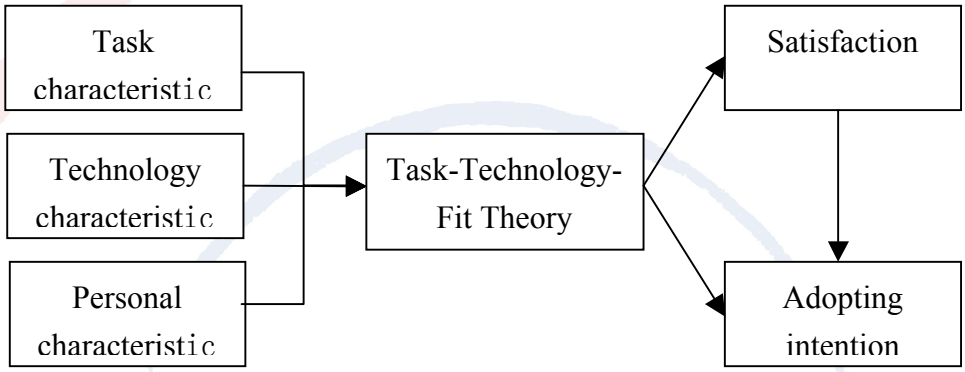

Figure 1: Model tested in the study

3. Research Method

3.1 Experiment System

Figure 2 shows the structure of the gesture-based learning system for supporting circuit course. This research uses the Kinect sensor to develop a gesture-based learning system for supporting circuit course, system functions are speech recognition, gesture recognition, instant quizzes. Accordingly, additional learning materials with phenomenon explanations and realistic illustrations were developed, including digital text, images, to help students comprehend the learning content. Learners can learn circuit course by gesture recognition and voice recognition, just like they interact in the nondigital world.

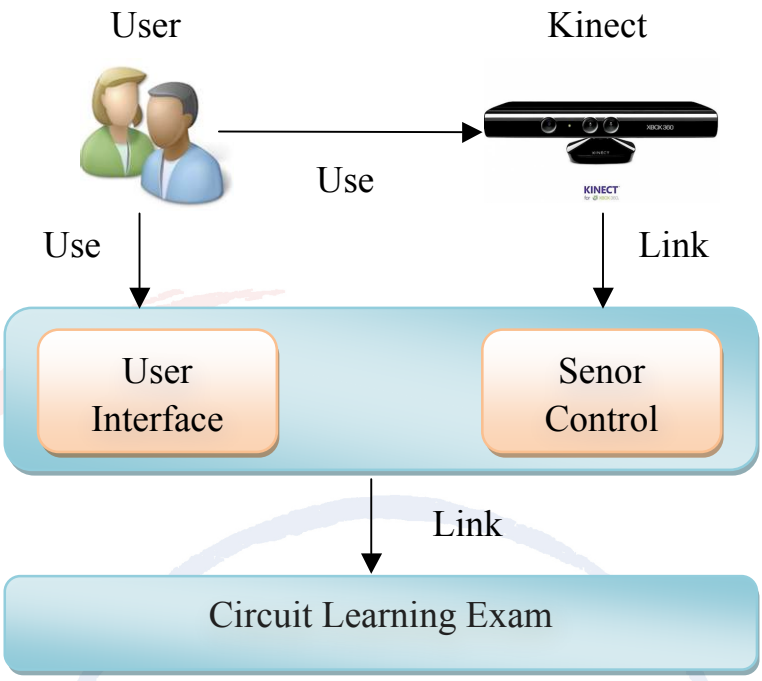

Figure 2: System Structure

3.2 Measurement

The questionnaire of Task–technology fit was modified from the questionnaire items developed by Goodhue & Thompson (1995). It was used to explore learner's satisfaction and adopting intention toward Task-Technology-Fit Theory with a 7-point Likert scale, where '7' represented 'strongly agree' and '1' represented 'strongly disagree.' The participants were 30 college students who have been used the gesture-based learning system.

3.3 Data analysis

The relationships in the model were tested using partial least squares (PLS). PLS provides an alternative estimation approach to traditional structural equation modeling (SEM). A two-step approach commonly used in SEM techniques was used to evaluate model fit. The approach involves first testing the fit and construct validity of the proposed measurement model and then, once a satisfactory measurement model is obtained, the measurement model is ''fixed" when the structural model is estimated (Hair et al. 2006). SmartPLS version 2.0 was used to assess the measurement model and the structural model.

4. Research Result and Discussion

A total of 30 college students participated in the study. Whilst being essentially a convenience sample, the participants covered a broad spectrum of IT experience and training. They had a wide range of levels of usage of the gesture-based learning system. Figure 3 shows the standardized coefficients for each hypothesized path in the model and the R^2 for each dependent variable. Based on 30 valid samples and data analysis, this study found that learners' awareness, task characteristic, technology characteristic and personal characteristic were highly related to task-technology fit.

Furthermore, task-technology fit also significantly affected learner's satisfaction and their adopting intention of the gesture-based learning system.

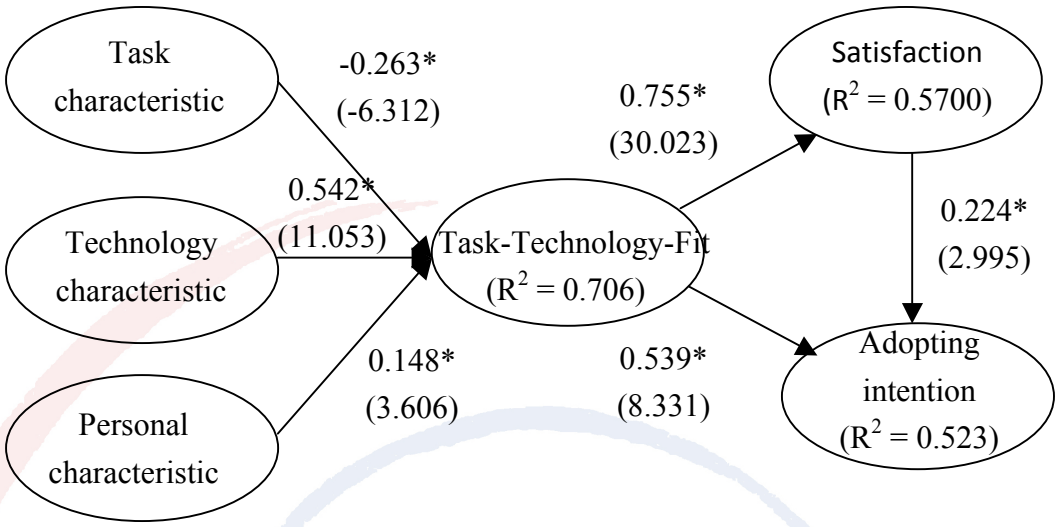

Figure 3: Structural model results

The ability of the model to explain the variance in the dependent variables was the second criterion used to evaluate the model. The R^2 values are measures of the ability of the model to explain the variance in the dependent variables and are reported in Figure 3. The model explained 70.6 of the variability in Task-Technology-Fit, 57.0% the variability in Satisfaction, 52.3% the variability in Adopting intention.

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TEDucation: Input and Output; 2 Ways of Using TED Talks in the Classroom

Jason Wolfe

Tokyo Gakugei University International Secondary School, Japan

0450

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Abstract

Proposed Schedule:

1) 5 mins
What is TED? What do you know about TED? What is TEDx?
What is Super Presentation? When is it on TV and what channel?
Who am I? [1]Why do I think I should be talking about this?
Why should teachers use it? (*TED talks are current, popular and engaging for many people including students. The topics are wide-ranging and fun. TED.com provides some innovative ways to use the talks for ESL learners and this workshop will identify some.*)

2) 20-mins
How TED.com works. (New releases, Tags, Downloading)
How to view TED talks with multi-language subtitles.

- Could use TED talks as a basis for classroom discussion and subtitles ensure understanding

How to view TED talks with multi-language transcripts.

- Could be used for translation exercises

How to use the hyper-linked transcripts

- Could be used for pronunciation and inflection practice as you can keep clicking and the line will repeat

How to use the hyper-linked transcripts in multiple languages.
How to copy and paste transcripts into a Word doc and create an active listening activity by deleting words.

- See Appendix 1
- Show AWL finder/highlighter as an example

Question? Is using TED talks in my ESL classroom anything more than a current, and perhaps cooler, video? (maybe not, but watch out for the next step)

3) 20 mins

How to turn your classroom into a TEDx event that is listed on TED.com

- Review TEDx rules
- All students need to come up with their own idea worth sharing and share it (in English!)
- A series of steps is needed for this and I will share my personal experiences including some video.
- Need to film the event, edit videos, add subtitles, and upload to YouTube, so some computer skills are needed. This would make an excellent team-up with the IT/PC department in your school.

4) 10 mins

Additional ideas for using TED in a classroom:

[1] I am a teacher and TEDx volunteer having assisted and organized seven TEDx events around Tokyo.

Translation Projects

- Could translate a new TED talk into Japanese as class, or individually, and upload it to TED.com This would turn an English classroom into a project that would be a direct benefit to many people.

The TED community

- After using a TED talk in class or for homework, try to get some questions about the content and then post the questions to TED.com and start a conversation.

Are there any TEDx events near me? (Teachers need motivation and creativity too!)

- How to find local TEDx events

Workshop Description:

The first half of this workshop, the input, starts with an introduction to TED, but will not spend long on the details. With its "cool" and current talks on far ranging issues, TED makes an excellent addition to any classroom. With the multi-langue subtitles and multi-language hyper-linked transcripts, as well as talks as short as 3 minutes, TED also makes a welcome addition to the ESL classroom. The second half of the workshop, the output, moves beyond simply "pushing play," and encourages educators to use TED as a new tool to engage students. By using the TED style presentation as a platform for students to share *their* idea worth spreading, educators can enliven their classrooms and educate. Turning your classroom into a real TEDx event, or as real as the educator desires, will give students a sense of realism often left out of classrooms.

- Objectives and expected outputs
  - Understand how to use TED.com as a modern tool for ESL students
  - Learn how to load TED
  - Understand how to use the TED format to give ESL students a platform
  - Learn where to go for TEDx events near me

- Focal areas and issues
  - This workshop would focus on intermediate level to advanced level ESL classrooms, but since many TED talks are subtitled in Japanese it could be used in lower levels as well.
  - Potential issue could be privacy concerns of students and/or parents

Format: Ideally workshop participants would have a laptop with internet access and they could do all steps as I do, however a person could simply watch and take notes or share a laptop.

Appendix 1

Geoff Mulgan: A short intro to the Studio School

http://www.ted.com/talks/geoff_mulgan_a_short_intro_to_the_studio_school.html

What I want to talk about today is one idea. It's an idea for a new kind of school, which turns on its head much of our _____ thinking about what schools are for and how they work. And it might just be coming to a neighborhood near you soon. Where it comes from is an organization called the Young Foundation, which, over many decades, has come up with many _____ in education, like the Open University and things like Extended Schools, Schools for Social Entrepreneurs, Summer Universities and the School of Everything.

And about five years ago, we asked what was the most important need for ¬¬¬¬¬¬¬_____ in schooling here in the U.K. And we felt the most important _____ was to bring together two sets of problems. One was large numbers of bored teenagers who just didn't like school, couldn't see any relationship between what they learned in school and future jobs. And employers who kept complaining that the kids coming out of school weren't actually ready for real work, didn't have the _____ _____ and experience.

And so we try to ask: What kind of school would have the teenagers fighting to get in, not fighting to stay out? And after hundreds of conversations with teenagers and teachers and parents and _____ and schools from Paraguay to Australia, and looking at some of the academic research, which showed the importance of what's now called non-cognitive skills -- the skills of _____, resilience -- and that these are as important as the _____ skills -- formal academic skills -- we came up with an answer, a very simple answer in a way, which we called the Studio School. And we called it a studio school to go back to the original idea of a studio in the Renaissance where work and learning are integrated. You work by learning, and you learn by working. And the design we came up with had the following _____.

First of all, we wanted small schools -- about 300, 400 pupils -- 14 to 19 year-olds, and critically, about 80 percent of the curriculum done not through sitting in classrooms, but through real-life, _____ projects, working on _____ to businesses, NGO's and others. That every pupil would have a coach, as well as teachers, who would have timetables much more like a work environment in a business. And all of this will be done within the public system, funded by public money, but independently run. And all at no extra cost, no selection, and allowing the pupils the route into university, even if many of them would want to become entrepreneurs and have _____ _____ as well. Underlying it was some very simple ideas that large numbers of teenagers learn best by doing things, they learn best in teams and they learn best by doing things for real -- all the opposite of what _____ schooling actually does.

Now that was a nice idea, so we moved into the rapid _____ phase. We tried it out, first in Luton -- famous for its airport and not much else, I fear -- and in Blackpool -- famous for its beaches and leisure. And what we found -- and we got

quite a lot of things wrong and then improved them -- but we found that the young people loved it. They found it much more _____, much more exciting than traditional education. And perhaps most important of all, two years later when the exam results came through, the pupils who had been put on these field trials who were in the lowest performing groups had jumped right to the top -- in fact, pretty much at the top decile of performance in terms of GCSE's, which is the British marking system.

Now not surprisingly, that influenced some people to think we were onto something. The _____ of education down south in London described himself as a "big fan." And the business organizations thought we were onto something in terms of a way of preparing children much better for real-life work today. And indeed, the head of the _____ of _____ is now the chairman of the Studio Schools Trust and helping it, not just with big businesses, but small businesses all over the country.
We started with two schools. That's grown this year to about 10. And next year, we're expecting about 35 schools open across England, and another 40 areas want to have their own schools opening -- a pretty rapid spread of this idea. Interestingly, it's happened almost entirely without _____ _____. It's happened almost entirely without big money behind it. It spread almost entirely through word of mouth, _____, across teachers, parents, people involved in education. And it spread because of the power of an idea -- so the very, very simple idea about turning education _____ _____ _____ and putting the things which were marginal, things like working in teams, doing practical projects, and putting them right at the heart of learning, rather than on the edges.

Now there's a whole set of new schools opening up this autumn. This is one from Yorkshire where, in fact, my nephew, I hope, will be able to attend it. And this one is focused on creative and media industries. Other ones have a focus on _____ _____, tourism, engineering and other fields.
We think we're onto something. It's not perfect yet, but we think this is one idea which can transform the lives of thousands, possibly millions, of teenagers who are really bored by schooling. It doesn't _____ them. They're not like all of you who can sit in rows and hear things said to you for hour after hour. They want to do things, they want to get their hands dirty, they want education to be for real. And my hope is that some of you out there may be able to help us.

We feel we're on the beginning of a journey of experiment and improvement to turn the Studio School idea into something which is present, not as a _____ answer for every child, but at least as an answer for some children in every part of the world. And I hope that a few of you at least can help us make that happen.

Thank you very much.

Considering eLearning and Collaborative Learning in secondary schools – an Australian perspective

Drew Mayhills

Applecross Senior High School, Australia

0132

The Asian Conference on Technology in the Classroom 2013

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Abstract

Drawing upon my experiences as an English teacher in a West Australian public school, this workshop explores a number of case studies in which groups of secondary school students were able to achieve improved outcomes with the support of technology.

Australian schools are in the process of implementing the Australian Curriculum - a set of national documents designed to promote a collaborative approach towards eLearning. Applecross Senior High School was involved in trialling the forthcoming Australian Curriculum in English throughout 2012, ahead of its 2013 launch. This workshop aims to share both the successes and challenges I experienced in this trial, whilst encouraging teachers to reflect upon these ideas in their own contexts.

To meet the requirements of the new English course, students were involved in the production of contemporary, multimodal narratives inspired by 'traditional tales.' I plan to showcase a number of these short films produced by student groups, produced entirely with smartphones and 'iMovie' software.

Furthermore, I will discuss the advantages that digital technologies present in terms of curriculum differentiation for students with special needs. Specifically, I will examine the ways in which access to webcam-equipped laptops and tablets has enabled students with learning difficulties to fulfil the requirements of presentational and speaking tasks.

The workshop will conclude by outlining several of the technology-based English programs I plan to trial in 2013, including a documentary film production task focused on environmental sustainability in Western Australia and a creative writing/poetry eReading group with a partnership school in Tampa, Florida.

Considering eLearning and Collaborative Learning: An Australian Perspective

Konnichiwa - good morning ladies and gentlemen,

First of all, please allow me to say what an excellent conference this has been so far. The quality of the presentations I saw yesterday was fantastic. I am very much looking forward to the rest of the conference.

My name is Drew Mayhills and I teach English at Applecross Senior High School, a state school in the southern suburbs of Perth, West Australia. Just a few quick things about myself; I am relatively new to the teaching profession, I thoroughly enjoy working with young people and I am very excited about what technology has to offer in an educational setting.

In the next thirty minutes, I will share with you some of my own experiences that demonstrate how technology is transforming the way I teach and subsequently, the way the students in my classes are learning.

Before I do that, though, I would like to pose two questions to you. I should preface that I definitely *do not* have definitive answers to either question, though I will share my personal views with you. What these questions will do, however, is serve as a conceptual framework for the rest of this presentation.

The first question – and although it may seem obvious, I think it's one we don't ask often enough – is, 'What is the point of school?' I've asked a lot of students this question in the past couple of months – and as you can imagine, the answers have varied dramatically. I have heard that the point of school is 'to study.' I have heard that the point of school is 'to get good grades,' and I have heard that the point of school is 'to get to know how the world works.' Perhaps the more practical purpose of school, as one student told me recently, is to 'work out what you're good at, so you can paid for it when you grow up.' You might not be surprised to learn that a few of the more troublesome students I asked remain convinced that there is no point to school whatsoever – but that is a separate issue.

In my view, the point of school is **'to prepare young people to be productive, responsive and responsible citizens that participate fully in their communities.'** It certainly sounds great aloud and it looks wonderful on paper, but I think it represents an extraordinary challenge.

The second question is, 'In 2013, what are the essential new skills that young people need to acquire at school in order to participate in society?' As our virtual identities and actual selves begin to merge, I am seeing in my own classes the need to develop a new kind of student; a critical thinker with the ability to exist in online *and* offline spaces. I believe that in 2013, schools need to be enabling students who are able to shift easily between these two modes.

Schools are complex machines and individual schools have an obligation to consider their own context when they are planning their objectives. For example, a school of approximately sixty students in the remote and largely Indigenous community of Bidyadanga has an entirely different set of contextual circumstances to the likes of

suburban Applecross, where some 1,200 students largely aspire for entrance to university. Irrespective of school context, however, I would sincerely hope that teachers all over the world can agree that schools must place two essential goals at the forefront of their planning:

- The first of these goals is that **students are taught how to thoughtfully integrate technologies into their lives in a way that enriches them.** I very deliberately used the words *productive, responsive* and *responsible* in my answer to the first question – 'What is the point of school?'

    - ***Productive*** – because there is an obligation on educators to teach their students *how* these devices can drive productivity, as opposed to hinder it;

    - ***Responsive*** – because we can only hope to develop responsive students when *we* are personally responsive to new technologies ourselves;

    - ***Responsible*** – because in an age where people ruin the reputations of themselves and others through the mismanagement of social media, students clearly need to be *taught* how to use this technology with due diligence.

- The second goal is that **students are taught in a way that promotes and celebrates the merits of working together – that is, working in collaboration.**

    - It is imperative that young people leave school able to work and get along with people they don't necessarily know, or even like. Every conceivable future available to them requires this attribute in some capacity.

With these ideas in mind, I want to consider today how eLearning and Collaborative Learning can help teachers to achieve these goals.

- **I define 'eLearning' as any type of educational activity that incorporates some degree of technology.**

- **'Collaborative Learning' I define as any type of educational activity that is undertaken in a spirit of cooperation with another student or students.**

I am not advocating for one moment that technology in the classroom is *'the way of the future'* and that one day soon, teachers themselves will be obsolete – that is entirely incorrect. The truth of the matter is that *technology in the classroom is already here*, and the teacher has never been more essential to the learning process. The cultural assumption that technology in the classroom will 'throw out the baby with the bath water' - that is, replace the teacher altogether - needs to be addressed, as does the misnomer that employing technology in the classroom will only make teaching more stressful. I will dismantle some of the reasons for this view at the end

of my presentation. What *is* required, however, is an initial investment of time, effort and commitment to creating a teaching practice rich in eLearning and Collaborative Learning.

I want to conceptualise these ideas at three levels; in the classroom, across the school and around the world.

Considering the classroom level first, I wish to explore a few of the ways I have embedded eLearning and Collaborative Learning into my own pedagogy.

For those of you not especially familiar with Australian culture, the idea of egalitarianism – the idea of 'a fair go for all' – is one that resonates strongly throughout my country. This philosophy underpins my use of an application on the iPad called a 'Random Name Generator' in my English classes. It is a simple enough concept: once a list of names is submitted to the app, a single tap of the screen 'randomly' selects a student name. There are endless possibilities to how this app can be used – nominating project groups, deciding who will present their speech first, selecting who will answer a question. While it is intended to serve as a 'name' generator, a teacher can submit any information they want and draw upon that. Consider for a moment the teaching possibilities in uploading literary quotes, key dates in history or scientific formulae. This is the kind of thoughtful eLearning can enhance *any* classroom practice.

Students respond positively to it for a number of reasons. Firstly, it is fair – because I have removed favouritism from the decision to ask a student a question. No more 'teacher's pets.' No more '…but you always pick on me, sir.' And why should a student with the surname 'Williams' always get to present their speech two days *after* a student with the surname 'Bourke?' A random name generator, then, is an exercise in both equity and efficiency.

Randomisation can be set to work its way through the student list or draw on students repeatedly, thus ensuring that student accountability remains constant. No one knows whose name will be generated next and a name could very well be repeated twice in a row. Beyond that, it is 'fun' – the anticipation of not knowing whose name will appear on the screen lends an almost theatrical quality to the learning experience.
The second app I want to examine is the use of a simple 'Timer' to outline how long has been allocated for a given task. In concept, this is hardly revolutionary; teachers have been using stopwatches, egg timers and the clock on the classroom wall for years. A timer that is accessed through eLearning, however, is pedagogically superior, for several reasons. Presented via a screen projector or a television, this kind of Timer is significantly larger than any of its predecessors and thus, clearly visible to everyone. Animated in real time, students constantly know how much longer they have to complete their work – this kind of overt expectation builds further safety into a lesson whilst reinforcing student accountability. Again, in terms of 'fun,' a novelty sound can be assigned to play at the end of the time allocation. My students often joke that there is no way they can fall asleep in a class where a deafening digital 'alarm bell' rings on a regular basis.

These simple eLearning enhancements to what is essentially Collaborative Learning practice have enriched my lessons to no end. An ongoing collection of anonymous feedback from students about the use of these technologies has revealed an overwhelmingly positive response. Comments regularly refer to the way this approach makes class 'more interesting,' 'more fun' and how 'it makes class fair…because everyone is always included.' While a small number of students were critical of the dependence eLearning places on access to Wi-Fi connectivity, they nonetheless supported the use of technology nonetheless.

At this point, I would like to invite you into one of my Year 8 English classes at Applecross Senior High School to observe some eLearning and Collaborative Learning in practice, as well as hear a selection of unscripted responses from a number of students about the use of technology in the classroom.

(VIDEO – CLASSROOM LEVEL 3:06)

Beyond the context of the individual classroom, I would now like to consider eLearning and Collaborative Learning at a whole school level. I am going to share with you three case studies of students using eLearning in my English classes. A short, informal interview with the students involved concludes each work sample. Each of these case studies highlights a specific advantage that an approach inclusive of eLearning and Collaborative Learning can offer an entire school community.

The first benefit to acknowledge is that eLearning and Collaborative Learning encourages and promotes new interdisciplinary connections. Most of us would be familiar with the established rapport between Maths and Science, or the conceptual links that Economics and Accounting share. On the other hand, the subject areas of English and say, Physical Education, have – at least traditionally – not enjoyed that kind of companionship. Through eLearning and Collaborative Learning, however, new opportunities present themselves for historically disassociated subjects to forge new relationships. At Applecross, one such emergent relationship is developing between English and a branch of Social Studies called 'Asia Awareness' – a newly established priority within Australian schools. Inspired by their work in 'Asia Awareness,' these two Year 8 students decided to reproduce a modern version of 'The Story of Yeh Shen' for my English class, in which they were studying traditional storytelling. Beyond their creative use of stop-motion animation, Amy-Lee and Fabiola's work is indicative of an approach in which eLearning facilitates the purposeful sharing of knowledge between subjects, promoting a holistic attitude to learning at the school level:

(VIDEO – 'THE STORY OF YEH-SHEN' 1:15)

Another advantage eLearning provides is that it enables teachers to make greater accommodation for students with special needs. Sadly, not every student with special needs is supported the way they should be. Too often, overstretched school systems determine that a student's learning difficulties do not warrant the appropriate funding or support – the young lady whose work I am about to show you is one of those students. Bec – who is a pleasure to teach, by the way – has issues with processing information, struggles with basic comprehension and as a result, regularly battles with

anxiety at school. Unfortunately, she does not qualify for any kind of additional support. Her success in class is highly dependent upon the extent to which I can differentiate tasks to navigate her learning difficulties.

In a study of autobiographical writing, students were required to present an excerpt of their work to their peers. Knowing that Bec would not cope at all with this, I offered the entire class 'an eLearning alternative' – to produce a short film using iMovie presenting the exact same material. With this differentiation, Bec went on to complete work of an impressive standard. The collective efforts of the whole class were later celebrated in a subsequent 'film premiere,' in which a number of projects were screened for other students. The whole experience has done wonders for Bec's confidence – and she is particularly thrilled about the fact that I am sharing her work at this conference. Take a look at this excerpt from her very Australian day out:

(VIDEO – 'A GREAT DAY OF CRICKET' 1:16)

The last point I want to reiterate at this level is how eLearning and Collaborative Learning enhances authentic engagement *for everyone* at school. The term 'engagement' is sometimes overused in education – but a teacher who is deeply conscious of their environment *just knows* when students are fully engaged in the learning process. A readily observable sign of that engagement is when you see students who love coming to class; students who spend the whole time *actually interested* in what is happening.

Equally, students can *instinctively sense* when a teacher is engaged with the learning process. A readily observable sign of that engagement is when the teacher gets to spend the whole lesson *actually teaching*. Genuine engagement minimises the need for behaviour management because the teacher is too busy cultivating and nurturing the students' interest in their subject. The potential that eLearning and Collaborative Learning offers, therefore, in terms of long term positive change to an entire school culture, is incredible – and I would suggest that in many instances, it is yet to be fully realised.

To demonstrate this, I am sharing the experience of a student whose behaviour has historically been problematic. The student in question, a young man named Emmanuel, is an individual who regularly seeks out opportunities to, in his own words, to 'space out' – that is, to misbehave or go 'off task.' His willingness to engage enthusiastically in eLearning and Collaborative Learning, however, has utterly nullified any previous inclination he may have once had towards disrupting my class. Like the other students whose work you have seen previously, Emmanuel's project is inspired by an unlikely combination of subjects – in this case, English and Interschool Basketball – but what I find most interesting are his comments on how the use of technology turns an otherwise uninteresting day at school into an worthwhile experience:

(VIDEO – 'WHAT BREAKS YOU MAKES YOU' 1:12)

The final component of my presentation today gives consideration to eLearning and Collaborative Learning at the global level. It has long been said that in the age of digital communication, the world has gotten 'smaller' – and in terms of what is now possible between schools around the world, some truly exciting projects are situated well within the realms of possibility.

Prior to teaching in Australia, I completed most of my teaching practicum while studying at the University of South Florida. I have since kept in touch with several staff at Liberty Middle School in Hillsborough County. Every so often, over Skype or email my colleagues and I would discuss the possibility of our respective classes working together on projects, organising student 'penpals' and otherwise thinking up ways for our students to share aspects of their broader school experiences. Invariably, the logistical issues associated with maintaining endless classes of emails functioned as something of a disincentive.

But that was in late 2009. The ever-increasing efficiency of internet-driven communication in 2013 provided sufficient motivation for a colleague from Liberty and I to launch what we describe as an 'iExchange' – the modern day equivalent of a 'penpal' style international school partnership, but one that actively seeks to utilise eLearning to facilitate the Collaborative Learning process as much as possible. This is very much a new venture for both schools and we are in fact only about two months into the process. My own students produced a 'Welcome to Applecross' video in which they introduced themselves and asked some questions of their new 'mates.' Here's a short sample:

(VIDEO – iEXCHANGE 1:21)

We plan to partner students from either school in the near future for the purposes of collaborating on written and audio-visual texts, as well as providing opportunities for them to form friendships with people outside their own cultural context. Initiating such a project, of course, has unearthed new ethical considerations and challenges - but it is a tremendously exciting project to be a part of. To any teachers in the audience who are perhaps interested in conducting an 'iExchange' with another of my classes from Applecross – please come and introduce yourself later, as I would love to discuss that with you. Needless to say, students from both countries have displayed boundless enthusiasm for the project. The possibilities are indeed endless for this kind of globalised eLearning and Collaborative Learning – the virtual classroom remains entirely unaffected by the tyranny of distance.

It has to be acknowledged, however, that not everyone is as optimistic as I am about the impact of technology in the classroom. I teach at a school that is in some ways resistant to change – to eLearning, in particular. It is occasionally frustrating to be met with that resistance, but I can understand why it exists. For years, teachers in Western Australia have been constantly baited by their employers that the latest gadgets would achieve the impossible. Promises were made that could not be kept – promises of technologies that would ensure engagement; promises of technologies that would guarantee the raising of standards; promises that, with new technologies, the constant pressures on teachers would be reduced.

Such ventures in the West Australian education system have not achieved these goals – I can personally relate to instances in which life has been made harder. So the cultural inclination to reject these ideas is, in some ways, justified. My view, however, is that this resistance is a direct result of the Australian education system overlooking the requirement to *teach the teachers* one of the goals I outlined at the beginning of this presentation: **how to thoughtfully integrate technologies into their lives in a way that enriches them.** On this point alone rests a compelling case for the broad dissemination of eLearning and Collaborative Learning methodologies in schools.

On the strength of my personal experience in the classroom, I am convinced that a practice rich in eLearning and Collaborative Learning yields superior outcomes in terms of student engagement, student accountability and student academic achievement. The scientific measurement of these variables is important – after all, it is the basis on which we determine what kinds of options will be made available to students beyond graduation. But I would like to stress that academic achievement is only *part* of what happens every day in a high school classroom.

What was the point of school again? I suggested that schools exist **to prepare young people to be productive, responsive and responsible citizens that participate fully in their communities.** Well, everyone wants to get good grades – but that only takes care of the part about being *productive*. In 2013, schools have an obligation to equip young people will the skills to use technologies thoughtfully and with maturity – that is, schools must enable students acquire the ability to be *responsive* and *responsible* within the online and offline worlds they inhabit. In addition, teachers must ensure that **students are taught** these skills **in a way that promotes and celebrates the merits of working together.** I firmly believe that a combination of quality eLearning and Collaborative Learning practices constitute a powerful vehicle for teachers to achieve these goals.

I mentioned at the beginning of this presentation that I am relatively new to the teaching profession. However, in my short time in the classroom, I have observed some extraordinary transformative changes in students as I continue to further integrate eLearning and Collaborative Learning into my practice. The feedback I regularly receive from students, parents and colleagues, in addition the academic results of students themselves, all lend support to the notion that eLearning and Collaborative Learning offers teachers the opportunity to create lasting positive change in the lives of young people. On that note, I would like to conclude my presentation by sharing a short film entitled ‘Kindness to a Stranger’ by a Year 10 student at Applecross Senior High School named Sam Bray. When Sam showed me his concept, I was instantly taken by its universality. I knew it would be an appropriate way to conclude this presentation.

(VIDEO – KINDNESS TO A STRANGER 1:52)

Thank you for affording me this opportunity to share my work with you, it has been a pleasure. Please enjoy the rest of the conference and have a fantastic time in Japan. *Domo arigatou gozaimasu* – thank you very much.

An Evaluation of Parents and Caregiver Perceptions of Online Communication in Intermediate (Middle) Schooling: Involvement and Effectiveness

Julie Lynch
John Hope
Kerry Lee

University of Auckland, New Zealand

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The Asian Conference on Technology in the Classroom
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An Evaluation of Parents and Caregiver Perceptions of Online Communication in Intermediate (Middle) Schooling: Involvement and Effectiveness

Julie Lynch
John Hope
Kerry Lee

University of Auckland, New Zealand

Abstract

A dominant theme of the 21st century has been the rapid changes in technology and the move towards online communication. The impact of these changes has influenced how schools interact and communicate with parents/caregivers. It has been well documented by researchers, and acknowledged by both educational leaders and practitioners, that effective partnerships between school and home have the potential to positively impact on student outcomes. The importance of parent engagement and involvement cannot be underestimated, yet in related research to date, the parent voice is rarely considered.

The purpose of this study is to help rectify this gap by evaluating parent and caregiver perceptions of online communication and how this involves them in their child's schooling. Through intermediate school-based research conducted in New Zealand, the study will identify how parents engage with online communication and examine the conditions that influence this involvement. This study will also determine how effective parents regard the online communication between school and home.

Respondents for this study were selected from parents/caregivers who had students at an intermediate school in Auckland during the 2011 school year. An online survey was sent out to the school community and in addition, six parents were interviewed face to face. Analysis of the data collected revealed three major themes which influenced the engagement of parents in online communication. These broad themes were the shared responsibility of the parent and teacher to support the child's learning, parent capability and understanding of the technology, and the expectations held by the parents towards the use of online communication by the school. From, the online survey and parent interviews it became clear that the parents wanted to be actively involved in their child's learning.

By identifying the conditions that influence parents/caregivers to engage in online communication, this study made it possible to develop guidelines for schools to enhance and encourage online partnerships.

Introduction

Engaging and involving parents, families and the community in students' learning is an important objective for every school. Forging partnerships between school and home enable parents to actively support their children and such relationships have been shown to have a strong impact on student outcomes (Alton-Lee, 2003). These school-home partnerships are dependent on educators initiating links and recognising strengths within the diversity of their school communities (Epstein, 2001; Grant, 2009; Harris & Goodall, 2008; Reynolds, 2005; Smrekar, 1996; Walberg, 1986). Epstein first pointed out in 1985 that "parental encouragement, activities, and interest at home and parental participation in schools and classrooms positively influence achievement, even after the student's ability and family socio-economic status are taken into account" (p.19). The challenge for schools is to maintain these partnerships in a world that has constantly changing forms of communication. Online communication systems such as school websites, email, wikis and learning management systems are just some of the ways in which schools are now interacting with parents and the wider community.

A recent innovation in online communication to connect teachers, students, parents/caregivers is the parent portal. The New Zealand Ministry of Education has defined a parent portal as a web-based gateway enabling parents to view their child's online data, which could include current topics, homework, assessment, attendance and achievement information (2010b). Part of a New Zealand Ministry of Education initiative, it was developed by KnowledgeNET, one of the providers of learning management systems to schools in New Zealand. The purpose of this initiative was to strengthen the links between school and home by enabling parents/caregivers to engage in online learning conversations with teachers and their children. The parent portal was seen as innovative as it had the potential to open lines of communication by providing parents with instant access to their child's electronic learning (Ministry of Education, 2010).

Across a range of research, there has emerged a strong argument that parents/caregivers who are involved in their child's learning make a positive impact on how well they achieve and develop (Alton-Lee, 2003; Biddulph, Biddulph, & Biddulph, 2003; Epstein, 1985, 1987, 1995, 2001; Ramsey, Harold, Hawk, Marriott & Poskitt, 1992; Walberg, 1986). Based on years of research, Epstein (1995) identified six major types of involvement between school, family and community. These were:

1) Parenting —helping all families to establish home environments to support children as students.
2) Communicating — designing effective forms of school-to-home and home-to-school communications about school programmes and children's progress.
3) Volunteering — recruiting and organizing parental help and support.
4) Learning at home — providing information and ideas to families about how to help students with homework and other curriculum-related activities, decisions and planning.
5) Decision making — including parents in school decisions, developing parent leaders and representatives.

> 6) Collaborating with community — identifying and integrating resources and services from the community to strengthen school programmes, family practices, and student learning and development.

These six major types of parental involvement created by Epstein provided the theoretical framework for this research study described below.

Previous research has focused on the positive impact that the digital environment has had on students' learning when effective partnership and collaboration occurs between teachers and students (Roblyer & Edwards, 2003; Condie & Livingstone, 2007). This research is limited however, when extended to digital communication between teachers, students and parents. The Best Evidence Synthesis conducted on New Zealand school leadership and student outcomes by Robinson, Hohepa and Lloyd (2009), stated that "research and development is also needed on how electronic media and the Internet can mediate effective connections between schools and homes, whanau[1], and communities" (p. 168).

The aim of the research described below was to hear the voice of parents and enable them to influence a school's online communication system. Hattie's (2009) research emphasized the importance of schools helping parents to "learn the language of schooling so that parents can provide every possible assistance to their children in terms of developing the child's learning and love of learning, and in creating the highest possible shared expectations for learning" (p. 33). By measuring parental involvement and engagement in online communication this research study acknowledged the importance of the parents' input into their child's learning by deliberating seeking their views, rather than considering the school's views. This was essential because as Lumby (2007) pointed out:

> the way their [parents] voice is heard is coloured by the assumptions and ambivalence of policy-makers, professionals and researchers. They [parents] are often conceptualized instrumentally in relation to how far they provide a perceived positive or negative influence on their child(ren) and on schools (p.221).

This research was therefore instigated with the purpose of informing and enhancing future practices of schools by offering guidelines to support parent involvement in digital communication.

Research Questions

This research study was designed to consider the following key questions:

1. How did parents engage in online communication?
2. What conditions influenced the involvement of parents with online communication?
3. How effective did parents regard communication between school and home?

[1] A New Zealand Maori word meaning extended family, that is now common usage within New Zealand

Methodology

New Zealand schooling begins on the day a child turns five, and comprises six years of primary school, two intermediate school years, and five secondary school years. A particular feature of New Zealand education system is it's decentralised nature, with each school having its own Board of Trustees comprised of seven elected parents, one elected teacher, the principal and, if a secondary school, one elected student. The Board of Trustees has more power than in most school systems. They govern the school, hire and fire all staff, including the principal, manage the finances, maintain the property and have a voice in the implementation of the curriculum. In the New Zealand system, parents have an active role in the life of the school, so accurate and timely communication between school and home is critical.

Contextual Background

The research took place at an Intermediate School located in Auckland, New Zealand. The school was classified as decile 9 (generally with children from a high socio-economic area), co-educational with a roll of approximately 600 students at the time of the research. The Intermediate had a diverse range of ethnicities amongst the children who attended the school, approximately 30 different nationalities being represented. Most of the students were New Zealand born but the school also attracted international students, mainly from Korea, and there were approximately 20 such students at the time of this research. The school catered for the middle years (11-13 year olds) with approximately 28 teaching staff.

In the learning management system at this particular school, each student is required to create a home page, which not only links to work, subjects and websites but also describes their goals and interests. This webpage encourages students to express themselves creatively through text, images and animations and also develop web design skills. The home pages in the learning management system enhance communication and collaboration across the school as each student links to their class page, homework page, team pages and single subject areas such as Arts and Technology.

Another tool within the learning management system, which parents have access to is the portfolio pages of their child. This contains student self-reflections on their work, assessments, and artefacts they had created. The parents/caregivers also have access to the learning journals, which are tools that allow students to record and present their ideas using a variety of multimedia methods such as audio recordings, video, and static images. They encourage dialogue and collaboration as the teachers, parents/caregivers, and peers are able to make comments in the learning journal. One of the advantages of the learning journals is that they can be used for a range of purposes such as recounting or recollection of events, recording the process the student went through to complete a task or as a place to store information. Students are able to evaluate their own progress as well as the progress of their peers. Students are able to scaffold each other through the learning experience by sharing websites, video clips, images, and information they have researched. Teachers as well as parents/caregivers are able to make suggestions or recommendations on the learning journals.

Teachers communicate with parents and students through the online school notice boards about up-coming events. The School Calendar also allows the school

community to view important events and dates. Both the School Calendar and School Noticeboard were updated regularly by teachers and the senior leadership team in the school. Through the parent portal, teachers provide parents with digital resources to assist with their child's progress in the Caregiver Resource area. Parents/caregivers can view absenteeism and update personal contact information in the School Records area of the parent portal. The School Area was used by this particular school to store the programme overview for the school, teacher online resources, and to store planning units. The school had allowed the parents/caregivers access to this area to allow transparency and open communication between school, students, and home.

Research Approach

This research used a case study format to conduct an in-depth investigation into a single Intermediate School. The study design used a mixed methods approach, combining quantitative and qualitative methods. Two types of evidence were collated and triangulated; an online survey completed by parents and individual interviews conducted with a small sample of randomly selected parents. Parents/caregivers were asked questions about how they support their child at home, the different forms of communication related to school programmes and their children's progress, opportunities for volunteering, learning at home, decision-making in particular if parents/caregivers would like a say in what their child is learning and finally questions around collaboration with the community. An online survey tool was used to gather qualitative and quantitative data from the parents/caregivers using *Survey Monkey®,* a tool that allows users to create their own online surveys using question format templates and collect responses electronically.

Results and Discussion

This small scale research study has attempted to address an area of research previously lacking by opening up a small space where the voices of a group of parents have been heard. In using a methodology to enable participants' voices to be articulated, it demonstrated how important it was to consider both the perceptions and perspectives of these particular stakeholders.

Assumptions and conclusions can be made by schools, teachers, policy makers and educational commentators about parental involvement and engagement, that may not necessarily be current. Harris and Goodall (2008) supported the idea that "parental engagement initiatives presuppose that schools, parents and pupils are relatively homogeneous and equally willing and capable of developing parental engagement schemes and general school norms, which is not always the case" (p. 279). This research found that introducing a new technological initiative like a parent portal is not always going to be fully embraced by the whole school community, as it will depend on values and aspirations held by parents towards their own child's schooling. As demonstrated in this study, the response rate to the online survey by 30% of school families suggests that many parents/caregivers are prepared to spend time submitting their opinions and ideas on how this online environment can support their child's learning and schooling, so need to be consulted.

From the findings of the research several conclusions can be made regarding parents perceptions of online communication. Firstly, parents/caregivers are seeking active, meaningful involvement in their children's schooling. The parents/caregivers strongly believed it was their responsibility to support their child's learning at home. This belief supports research conducted by Peters et al. (2007) who found "parents today are also more likely to see education as their own responsibility rather than the school's, and this could heighten their sense of involvement" (p. 98). Desforges and Abouchaar (2003) also noted that:

> The impact of parental involvement arises from parental values and educational aspirations and that these are exhibited continuously through parental enthusiasm and positive parenting style. These in turn are perceived by the student and, at best, internalised by them. This has its impact on the student's self-perception as a learner and on their motivation, self-esteem and educational aspirations. (p. 35)

However, in relation to technological involvement this research found that this was not always the case. The parents/caregivers believe it is their responsibility to support their child's learning at home but they are not aware of, or accessing, relevant resources provided by the school to do this.

However, the survey results did reveal that parents accessing the learning management system had clear expectations of what they expected to view online. The study found that when using KnowledgeNET, parents/caregivers wanted their child's academic progress to be available for them to view and monitor in a more timely manner. The parents/caregivers also expected current work to be online and accompanied by feedback from the teacher. Many of the parents/caregivers were viewing the homework pages online and commented that they expected the tasks to be relevant to current learning.

From the survey and interview comments, it was clear that some parents/caregivers needed guidance on how to support their child's learning. "Parents will be involved if they see that supporting and enhancing their child's school achievement is part of their 'job' as a parent. Likewise, parents will get involved if they feel they have the capacity to contribute" (Harris & Goodall, 2008, p.280). Capacity to contribute could be compromised by the finding that 30% of respondents did not understand some of the terminology used on the parent portal and 30% were not fully confident in using the technology. The interview participants certainly believed that supporting their child was part of their job and they emphasised the desire of having the capacity to contribute, hence wanted the teacher to provide guidelines or summaries of the learning. Such a requirement has also been previously expressed amongst students; "when adolescents perceive that their parents have high educational goals, they have more interest in school, greater academic self-regulation, and higher goal pursuits" (Kreider, 2007, p. 5).

The parents/caregivers also stated that access to the learning management system was one of the benefits. Often research indicates that parents experience practical barriers that prevent active involvement with their child's learning and communicating with schools. Grant (2009) for example reported that some of these practical barriers that parents face as:

> time to help with homework or meet teachers often cited as a major barrier, with working parents, fathers and lone parents more likely to see this as a problem. Childcare and transport costs and opportunities are also described by parents as significant barriers (p.9).

The online survey revealed that half of parents (52%) indicated they were not too busy to use the parent portal. But despite online communication through a parent portal allowing parents/caregivers to view their child's learning and what is happening at school when it is convenient for them, a question about the frequency of viewing the parent portal resulted in a range of responses. Only one parent viewed the portal daily, 40% logged on once a week and 58% only logged on once a month.

The majority of the survey respondents were female (78%), possibly reflecting a traditional perception that the female is the predominant child carer. This perception is reinforced by the finding that despite 62% preferring to view the parent portal in the evening when most family members would be present in the home, most respondents viewed the parent portal alone, or with their child, few viewing it as a family.

Some conflicting results also occurred around the question of whom the respondents were using the parent portal with. 66% of respondents stated that they preferred to look at the parent portal on their own, yet when asked if they preferred to view the parent portal with their child present 67% agreed. The results were further confused by 44% agreeing that they preferred to look at the parent portal with other family members present. Hence stated viewing preferences were not always supported by stated viewing facts. It was therefore difficult to definitively determine from these results how parents/caregivers were viewing the learning management system at home. Further research could investigate exactly who the parents are interacting with when using the parent portal, when, and why. There are many possible viewers such as their child's siblings, whanau or even the wider community.

Regardless of the questions about when and with whom they used the parent portal, it was seen as flexible and a way of helping to manage parent-child-teacher relationships. Previously parents/caregivers would have to rely on their child to find out what happened at school or wait for communication from the school in the form of reports or parent interviews. From the survey results it is clear that the parents recognise the potential of the parent portal to inform them about their child's academic process, what their child is learning in class, opportunities for volunteering to be involved with school events and extra-curricular activities. Parents indicated their preference for the parent portal as a form of communication as opposed to telephone contact, school website, and in some cases face to face contact depending on the reason for communication.

Considerations and Guidelines for Schools Considering Similar Initiatives

The key message from this research is that schools need to collaborate with parents to determine what their expectations are with regards to online communication, especially through technologies such as parent portals. It is recommended that this collaboration takes the form of parent consultation through online surveys and workshops conducted by the school.

The parents/caregivers clearly articulated their expectation that they should have access to their child's academic progress and online school reports. This has

implications for educational practice between school and home. Schools will need to ensure that academic data viewed by parents is presented in a way that reflects the context of the learning and is easy to understand. Parental education would also be required on how to raise their child's achievement, understand academic data and use systems like KnowledgeNet.

The learning management system appears to have been successful due to the principal's attributes of effective leadership and managing the process of implementation. This success was underpinned by a deep understanding of the theory behind parental involvement and how to utilise a learning management system effectively into the teaching and learning. Edwards and Alldred (2000), Grant, (2009), Harris and Goodall, (2008) have warned that without a depth of knowledge in this area, there exists the possibility that decisions will be made that hinder partnerships between school and home or impact negatively on certain sections of the school community .

The principal of the school involved in this research study was known as an early adopter of new ICT ideas and strategies. The school had been using KnowledgeNET as their learning management system for the past eight years, and was one the first schools in New Zealand to do so. This demonstrated the foresight of the principal and the leadership team at the school. The principal was willing to invest and support the development of the learning management system by ensuring teachers had the knowledge and skills to do this and ensured that resources such as support materials were readily available. The teachers had time to try out and evaluate how they would use the parent portal to inform students and parents about their schooling. All stakeholders had an input into decision making through discussions and surveys. The principal also encouraged leadership in school by allowing teachers and students to try new ideas (Ely, 1990). However, engaging parents/caregivers to use the parent portal effectively needed further enquiry by the school, hence the purpose of this research.

However, just providing access is not enough, as parents need guidance on how to use the technology to support their child's learning. Research has emphasized that "schools need to make the shift to encouraging parental engagement in learning in the home through providing levels of guidance and support, which enable such engagement to take place" (Harris & Goodall, 2008, p. 286). Certainly technological advances help to support such engagement for parents by making it easier to be able to access resources about their child's learning through learning management systems like KnowledgeNET. However, as the research by Harris & Goodall clearly states, it is important that guidance and support is implemented by the school. This needs to take the form of parent training, information sessions, and workshops.

The role of the teacher in assisting parental engagement is critical. The importance of the teacher to scaffold how to use the technology effectively, how to respond to students learning online and create relevant resources that help and support parents/caregivers, is essential. Teachers need to ensure that the purpose of the learning is clearly defined and the outcomes for students are clear, to provide structure for the parent (Falloon, 2004). Research has stressed "the importance to many students of being able to share what they have achieved, and receive appropriate reinforcement for it" (Falloon, 2004, p. 284). This needs to be facilitated by the teacher so parents feel confident in their involvement in their children's education.

The parent portal has the capabilities, if used effectively, for students to share achievement and receive reinforcement from peers, teachers, and parents.

The comments made by the parents in the online survey and during the interviews highlighted the strength and quality of interactions between themselves and their child. It was clear, especially from the interview responses, that a variety of academic, social and emotional learning was taking place at home. Parents were able to view homework online, which in turn allowed them to support their child with the resources and time to complete tasks successfully. Effective three way partnerships through the parent portal relied on teachers providing clear guidelines and expectations around the learning, so that parents were able to understand and support their child.

A further unique aspect of this research related to the relationship of the researcher to the school and students, which allowed access to caregivers and parents. This established relationship with the school may have assisted in creating a climate that allowed the parents to speak freely during the interviews. The parents spoke freely about homework requirements and academic progress, many also described how they exposed their children to other areas of learning such as life skills, sporting and cultural events, debates around world or global issues, and visits overseas. This highlighted the importance of linking the experiences between school and home to make it more relevant for students, which the learning management system can assist with. This concept has been researched by Grant (2009) who emphasizes the importance of creating third spaces. The idea is that the "two different cultures of school and home can coexist and come into conversation with one another" (Grant, 2009, p. 11). A particular strength of this research is access to parent voice, which is often discussed theoretically, but only sometimes heard.

Conclusion

This study has revealed the potential of the parent portal to involve parents/caregivers in their children's learning. It demanded a close examination of key influencing factors such as how parents engage in online communication, which conditions influenced the involvement of parents and how effective parents regarded the parent portal. A report conducted by the Education Review Office (2008) concluded that "Finding new ways to make contact with the parents who, for a variety of reasons, find it difficult to come through the school gate requires schools to be pro-active and open to trying new approaches to engagement" (p. 45). Certainly this particular intermediate school is trying to find an alternative way to engage parents in their child's schooling.

The primary conclusion the researcher has made from this study, is that building a meaningful partnership between school and home is paramount to the success of new technologies such as the parent portal. In particular, parent voice must be heard. Simply providing access to their child's learning is not enough. Schools need to provide support, consult with the community, and establish expectations with all their stakeholders. The parents in this particular study voiced their support of KnowledgeNET and the parent portal because it provided a window into the school life of their child, a window the caregivers and parents could access anytime and anywhere. However, it should not be assumed that the parent portal alone provides parents/caregivers access to their child's learning. There needs to be a delicate

balance between teacher-student-parent involvement with a clear learning pathway and structure. Each stakeholder has a responsibility, which must be explicitly defined for the implementation of learning management systems and parent portals to be successful across the school community. Otherwise the ability to engage all stakeholders will be limited and as such, reduce the potential of involving many parents in their child's schooling.

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