Available online at http://rjas.rsu.ac.th

Rangsit Journal of Arts and Sciences, January-June 2017 RJAS Vol. 7 No. 1, pp. 23-32

ISSN2229-063X (Print)/ISSN2392-554X (Online)

A study utilizing an online application to improve student reading comprehension of undergraduate students in a Private International University

Edward Bacon[1*] and Supinda Lertlit[2]

Department of Bilingual Education, Faculty of Education, Rangsit University, Patumthani 12000, Thailand
[1]E-mail: rangsiteddie@yahoo.com; [2]E-mail: slertlit@hotmail.com

[*]Corresponding author

Submitted 10 October 2016; accepted in final form 30 January2017
Available online 29 June 2017

Abstract

Technology is very much a part of our daily lives, and is only natural to want to implement the same technology in our classrooms. Thus, this study engaged undergraduate international university students from distinctive linguistic backgrounds, utilizing Eddie's Vocab Challenge, testing its impact on the students' capacity to comprehend fundamental English reading passages. When initially introducing technology into a classroom setting, it is not a matter of simply adding an interactive online exercise randomly, but rather making sure the newly integrated technological application and/or feature is synchronized with a classes' or course's overall curriculum development or design. During the course of this study, a mixed method of both quantitative and qualitative approach was utilized. First of all, both (control and experimental) groups participated in a 100-question reading comprehension pre-test and post-test. Secondly, students were asked to participate in focus groups that were randomly selected. Lastly, the researchers kept audio journals after each teaching session. When compared to utilizing teaching methods, the findings of this study showed that by using a flash-based vocabulary-oriented in-class online application, students reading comprehension scores in the experimental group improved 12% as opposed to the control group's 5%. Additional unintended findings of the study also found that student motivation improved 14.2% more in the experimental group than did in the control group. The other unintended finding was that the student truancy decreased 6.8% more in the experimental group when compared to the control group.

Keywords**:** *curriculum development, Eddie's Vocab Challenge, flash-based vocabulary-oriented in-class online application, in-class online application, reading comprehension*

1. Introduction

The ever-changing technology in the outside world has not only radically altered how people exist, make a living, and how we interact, but it has also transformed the contemporary educational framework (Lan, Worch, YuChun, & Aguitan, 2015). By integrating technology in the classroom (from the outside world), it can revolutionize the way students acquire knowledge, enhance student involvement, and assimilate distinctive groups of students together as one (Conefrey, 2016).

Being one aspect of technology, utilizing a flash-based vocabulary-oriented in-class online application in the classroom offers a way for both teachers and their pupils to understand the significance of the curriculum through their participation in meaningful encounters with technology. Flash-based technology is blended with enticing computer animation, communication, and interactive media elements that embody the first-rate elements of the internet in the areas "of free or low-cost, high quality informational and instructional materials" (Lamb & Johnson, 2006, p. 54). However, numerous teachers feel uncomfortable about their students' infatuation with "technology" (Lane-Kelso, 2014, p. 818). Even more, some teachers don't possess instruction, knowledge or support to implement technology in the classroom (Safitry et al, 2015). Some other main obstructions preventing the utilization of an in-class online applications in the classroom: (1) educator's understanding in the area of study; (2) relevance of in-class online applications (or lack thereof) to the curriculum; (3) getting the online applications ready for implementation; (4) insufficient technological infrastructure at the school; and (5) the right or opportunity to use in-class online applications (Allsop, Yildrium, & Screpanti, 2013). The current justifications for not using technology in the classroom can no longer be tolerated, as instructors need to possess the instruction, knowledge and support to evolve their teaching practices (Safitry et al, 2015). Educators need to receive proper qualifications on how to implement in-class online

applications so they are modeled after the curriculum (Allsop et al., 2013).

Simplified access to technology has impacted "learning theories and evaluation methodologies" in reference to using technology in the classroom (Levene & Seabury, 2015, p. 46), so when utilized properly, in-class online applications have a myriad of benefits (Allsop et al., 2013): (1) can give students the opportunity for "technology skills" to develop and prosper (p. 5); (2) can be used as a way of recognition of achievement; (3) can give students the opportunity to operate self-reliantly; (4) can give the chance for cooperative learning; (5) can expand "problem-solving/critical thinking" abilities (p. 5); (6) can inspire imaginativeness; (7) can upgrade education; and (8) in-class online applications can inspire students. Additionally, McClanahan (2014) stressed that by utilizing technology in the classroom: (1) can increase English development; (2) can develop conversational abilities; (3) can develop specialized abilities; (4) can give students the chance to experience real-life situations; (5) students can learn from various methodologies; and (6) can foster academic impartiality. Also, in-class online applications proved to be most beneficial for learners who generally fall behind, or do not fully understand the course content (Beserra, Nussbaum, Zeni, Rodriguez, & Wurman, 2014). There are those times when learning can be mundane, so using in-class online applications in the classroom can supply students with pleasure and inspiration (Lane-Kelso, 2014). Finally, utilizing in-class online applications can help to decrease truancy, improve students' attitudes and student achievement (Meyer, 2015). In order to best get our students ready for life after graduation, educators need to communicate and immerse students in the technological world inside their academic lives (Nowell, 2014). It is essential to integrate "print-based literacy and digital literacy" so the two forms (of literacy) can collaborate with each other to benefit students (Brosseuk, 2014, p. 20).

In the past few years there has been increasingly more research conducted in the field of using technology in the classroom. For example, research was done utilizing tablets in the classroom to foster creativity under a model called *Visual Thinking through Tablet-Based Classroom Instruction* (VTTCI) in Korea (Kim, Park, Yoo, & Kim, 2016). In this study, when compared to the control group, "the treatment group scored significantly higher . . . on overall creativity" (Kim et al., 2016, p. 207), thus providing evidence that technology within the confines of the classroom is a key asset. Additionally, another study conducted in Australia came to the following conclusions regarding the benefits of using technology in the classroom: (1) technology inspires and stimulates students; (2) technology offers learners options in the direction of what they view or study; (3) students can become more independent; and (4) technology offers adaptability in education (Spencer & Smullen, 2014). Finally, there was a study completed in England where technology in the classroom was utilized in a student-centered environment. The results indicated that by allowing students to learn in innovative manners, there was "greater student participation and higher-quality understanding" of the course content (Warren, 2016, p. 309).

Although, there has been increasingly more research done in the past few years pertaining to utilizing technology in the classroom, research has been lacking in a few areas. For example, utilizing technology (i.e. flash-based vocabulary-oriented in-class online applications) are presently aiding students to comprehend ideas or content they cannot comprehend in a textbook (Schaffhauser, 2013). However, in order for in-class online applications to be practical, they need to be a component of the curriculum instead of merely an additional unrelated segment (Meyer, 2015).

In addition, there seems to be little or no link in prior research between using technology in the classroom and reading comprehension. Effective reading comprehension encompasses varied "cognitive and affective abilities" (Kelley, Roe, Blanchard, & Atwill, 2015, p. 42), as it is an integral part of effectively understanding the English language (Beydarani, 2015). Since it is a prerequisite for proper reading comprehension for students to recognize vocabulary words and comprehend their definitions (Carlson, Jenkins, Li, & Brownell, 2013), integrating ways of developing learner's vocabulary and grammar skills into a curriculum is key (Mokhtari & Niederhauser, 2013). As a result, there are six factors when selecting vocabulary words to be taught (Fisher & Frey, 2014, p. 596): (1) "Representative" – Is the vocabulary word depictive of something a student should know? (2) "Repeatability" – Is the vocabulary word utilized more than once during the academic term? (3) "Transportable" – Will the vocabulary word be used in multiple contexts? (4) "Contextual Analysis" – Can the definition of a word be inferred by the way it

is being utilized in a reading passage? (5) "Structural Analysis" – Ability to separate a word into parts (i.e. root, prefix and suffix) to determine its definition. And finally, (6) "Cognitive Load" – Are the group of vocabulary words too numerous in numbers for the learners to effectively utilize them? Taking all those factors into account, allowing students the situations to also come across vocabulary words outside the classroom is an effective method to complement their knowledge of the particular vocabulary word (McKeown, Crosson, Artz, Sandora, & Beck, 2013). By using a flash-based vocabulary-oriented in-class online application, this method could enhance reading comprehension skills for students.

2. Objectives

The research objective is to study the impact that a flash-based vocabulary-oriented in-class online application for teaching vocabulary can play in exclusively increasing a student's reading comprehension skills in an international multicultural setting by including students from seven different countries (including Thailand, Myanmar, China, Netherlands, Bhutan, American and Russia). Therefore, this paper aims to contribute to the theoretical understanding of utilizing a flash-based vocabulary-oriented in-class online application in an international multicultural classroom by asking - Does using a flash-based vocabulary-oriented in-class online application in the classroom exclusively help to increase a student's reading comprehension skills?- indicated as a research question.

3. Materials and methods

3.1 Method introduction

In an effort to gauge whether technology inside the classroom is beneficial for students, this multicultural study utilized a flash-based vocabulary-oriented in-class online application that is proprietary to the researchers and utilized it in a manner to show improvement in student reading comprehension. The researchers based the game off of the popular game show Who Want to be a Millionaire? This flash-based vocabulary-oriented in-class online application is called *Eddie's Vocab Challenge*, and similar to the game show, it has a series of 15 questions in an effort to win the game. All reading comprehension questions in the flash-based vocabulary-oriented in-class online application are independent of each other and are completely nonaligned in terms of the setup of each game. The flash-based vocabulary-oriented in-class online application gauges the students' reading comprehension enhancement of the vocabulary words introduced in each lesson. Also comparable to the game show, this online application has three lifelines students can choose from: 50/50, phone a friend and ask the audience. Each question is vocabulary-based, and if the student answers a question correctly, they then move onto the next level. However, if the student answers a question incorrectly, they must then start over from the very beginning. In this flash-based vocabulary-oriented in-class online application, "a conditioned response" is created (Lineros & Hinojosa, 2012, p. 2).

With Eddie's Vocab Challenge, each student logs into the flash-based vocabulary-oriented in-class online application using their name and student ID number. When a particular student successfully finishes a particular game, an email is automatically sent to the researchers informing them which student successfully finished which game.

This mixed (quantitative and qualitative) method was conducted in a student-centered classroom. In an effort to find out if student reading comprehension improved as a result of the researchers' proprietary flash-based vocabulary-oriented in-class online application, the 44 research subjects were separated into two separate groups of one control group and one experimental group. The dissimilarity in the number of students between the two groups had to do with the availability of working computers in the computer lab. Students were selected from a common pool and randomly chosen based on their overall English levels based on reading, writing and listening abilities. All students in this study took an online Oxford placement test and received a score of C1 or higher or successfully passed all the English courses offered. The Oxford placement test gauges students' English listening abilities, as well as their understanding of English grammar (Wistner, Sakai, & Abe, 2009). The two groups of research subjects are as follows:

Control group: The researchers conducted the study with 28 multicultural international first-year and second-year students.

Experimental group: The researchers conducted the study with 16 multicultural international first-year and second-year students.

The researchers analyzed and compared the two groups of multicultural international students utilizing a written 100-question reading comprehension pre-test and post-test (Lougheed, 2014) to find out which group's reading

comprehension skills improved the most. The reading comprehension pre-test and post-test, which was first used in 1979, has been utilized by thousands of "corporations, English Training programs, English language schools" (Suzuki & Daza, 2004, p. 16). All data collection was conducted at one international college in Patumthani, Thailand.

3.2 Study procedures

Step 1: Received consent and endorsement from international multicultural university where the study took place.

Step 2: All participants signed consent forms to participate in the study, and were each given copies of the consent forms they signed.

Step 3: Students in both the control group and experimental group were tasked with completing a written 100-question reading comprehension pre-test (Lougheed, 2014) that could distinguish English reading comprehension into 5 different levels (A) ability to speak, read or write sufficiently as a non-native English speaker; (B) ability to speak, read or write in most situations; (C) can accomplish most routine circumstances and can accomplish certain business-related activities; (D) limited ability to speak, read or write in English; (E) insufficient English reading, writing and speaking abilities (Trew, 2007).

Step 4: Research subjects in the experimental group were asked to utilize the flash-based vocabulary-oriented in-class online application (Eddie's Vocab Challenge), whereas the research subjects in the control group were given paper-quizzes (with the exact same questions and answers used in the online application). At the beginning of each lesson, all students would login to play the flash-based vocabulary-oriented in-class online application playing a particular game, after which the researchers would go through the English lesson introducing key vocabulary words that were utilized in the flash-based vocabulary-oriented in-class online application. At the conclusion of each lesson, all students would again login to play the same game in the flash-based vocabulary-oriented in-class online application.

Step 5: All research subjects were expected to complete the course's Vocabulary Book, which was comprised of key vocabulary words that were utilized in the flash-based vocabulary-oriented in-class online application, after each lesson and turn them in as part of their homework.

Step 6: After each lesson, the researchers made an audio observational journal that was later transcribed into written form.

Step 7: For both the control group and the experimental group, there were student focus groups held in the middle and at the end of the study.

Step 8: Students in both the control group and experimental group were tasked with completing a written 100-question reading comprehension pre-test (Lougheed, 2014) that could distinguish English reading comprehension into 5 different levels (A) ability to speak, read or write sufficiently as a non-native English speaker; (B) ability to speak, read or write in most situations; (C) can accomplish most routine circumstances and can accomplish certain business-related activities; (D) limited ability to speak, read or write in English; (E) insufficient English reading, writing and speaking abilities (Trew, 2007).

3.3 Evaluation criteria

The researchers analyzed the control group against the experimental group by comparing the results of the groups' pre-test reading comprehension scores with that of the groups' post-test reading comprehension scores. In the end, the researchers assessed which group's reading comprehension scores improved the most.

4. Results

4.1 Reading comprehension test

In answering the research question (Does using a flash-based vocabulary-oriented in-class online application in the classroom exclusively help to increase a student's reading comprehension skill?), the results are shown below in Figure 1 pertaining to the 100-question reading comprehension pre-test and post-test (Lougheed, 2014).

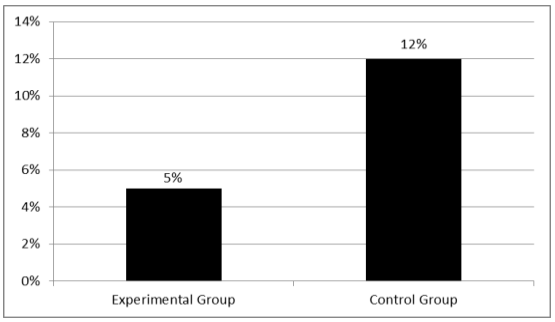

Figure 1 Percentage of improvement between the reading comprehension pre-test and reading comprehension post-test for both the control group and experimental group

As shown in Figure 1, the experimental group utilizing the flash-based vocabulary-oriented in-class online application increased 12%, whereas the control group that utilized the teaching methods that did not use technology increased by only 5%. The results show that when comparing the reading comprehension pre-test and post-test scores, the experimental group's reading comprehension scores increased over twice as much as the students in the control group.

4.2 Flash-based vocabulary-oriented in-class online application results

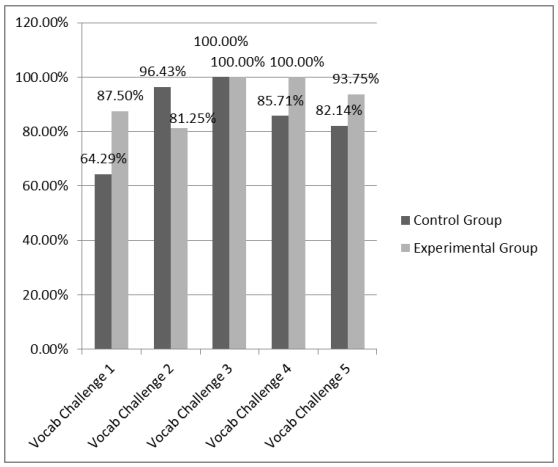

Figure 2 Student participation in the flash-based vocabulary-oriented in-class online application of experimental group versus the in-class paper- based quiz of control group

Figure 2 shows a higher percentage of students in the experimental group participated in the flash-based vocabulary-oriented in-class online application at 92.5% versus the students in the control group at 85.7%. The results show that when comparing the percentage of in-class online application games that were finished, the experimental group finished 6.8% more of the games than the control group did. Since more students in the experimental group successfully finished more of the in-class online games, it shows that students in the experimental group had a lower truancy rate than the control group. As previously stated, utilization of technology in the classroom can help to decrease truancy (Meyer, 2015).

4.3 Vocabulary book results

Just as Figure 2 relates to the motivation of the students in this study, Figure 3 also addresses the key factor of motivation (in terms of completing the assigned homework):

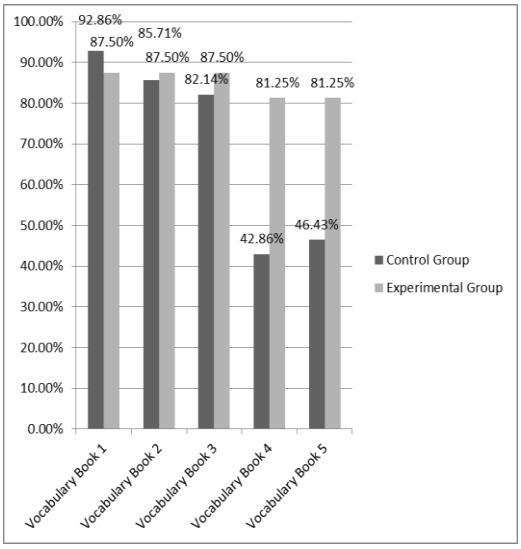

Figure 3 Completion of assigned homework: experimental group versus control group

Figure 3 shows, a higher percentage of students completed the assigned homework at 84.6% versus the students in the control group at 70.4%. The results show that when comparing the percentage of homework that was finished, the experimental group finished 14.2% more of the time than the control group did. Since more students in the experimental group successfully finished their homework (as opposed to the control group), it shows that students in the experimental group had a higher motivation to finish their homework. As previously stated, utilization of technology in the classroom can help to inspire or motivate students (Allsop et al., 2013).

4.4 Student focus group

In the middle and at the end of the study, the researchers conducted student focus groups (for both the control and experimental groups), and the underlying theme of both groups was how much the students enjoyed playing the flash-based vocabulary-oriented in-class online applications, and how mundane the paper-based quizzes can be. One student in the control group stated that they would have preferred to play an in-class online game, instead of a paper-based test because they had played online games their whole life. Another student (in

the control group) stated that they enjoyed the card games the researchers used in class and preferred this style of exercise, as opposed to paper-based ones.

The experimental group enjoyed playing the flash-based vocabulary-oriented in-class online application, as a few students stating the application was very good and fresh. One student went further and stated that the game was of "good quality". However, there were a couple negative aspects about the flash-based vocabulary-oriented in-class online application that students did not approve of. For example, sometimes the flash-based vocabulary-oriented in-class online application froze up and students had to start over from the very beginning of game. Also some students did not appreciate the music of the online application that was utilized. But overall, students enjoyed playing the flash-based vocabulary-oriented in-class online application, as it was enjoyable and it allowed them to learn new vocabulary in a meaningful context.

4.5 Observational audio journal

Since all research subjects in this study either had to successfully pass all the other English courses (as this course was the most advanced English course offered at this particular international college), or they had to pass an online English placement test with a level C1 or higher, the overall student English level was rather high. Given those facts, there were large portions of the class who finished with the in-class quizzes in a short matter of time, as opposed to other international students who took a longer time to complete them (towards the beginning of the study). Some students finished the quizzes in less than two minutes, but most students completed the quizzes in less than 10 minutes. However, towards the end of the study most students finished the quizzes in five minutes on average for both the control group and experimental group.

One thing the researchers did notice towards the end of the study, however, was that for the majority of the students in the control group, taking the paper-based quiz was rather mundane and uninteresting, whereas the majority of the students really enjoyed participating in the flash-based vocabulary-oriented in-class online application.

5. Discussion

5.1 Online application benefits

Even though technological infrastructures are available in some educational institutions, hardly any educators are utilizing them (Rehmat & Bailey, 2014). At the beginning of this study, the researchers explored to find out one answer: Does using a flash-based vocabulary-oriented in-class online application in the classroom exclusively help to increase a student's reading comprehension skills? However, as the study progressed, the researchers found five main advantages in using technology in education (Alodail, 2016). First of all, through the use of the flash-based vocabulary-oriented in-class online application in this study, student motivation improved more than students that did not use technology in the classroom. This can be based on the fact that students utilizing technology in the classroom finished their homework 84.6% of the time, whereas students being taught in traditional teacher methods only completing their homework 70.4% of the time. Secondly, as Meyer (2015) stated, technology used in the classroom can help to decrease truancy. It was evidenced in this study as students who utilized the flash-based vocabulary-oriented in-class online application completed the online quizzes 92.5% of time, as opposed to students in the control group who completed 85.7% of the paper-based quizzes. In addition, as McClanahan stated in 2014 that using technology in the classroom can develop student interest. Additionally, technology inside the classroom can inspire students (Allsop et al., 2013). This factor was also evidenced in this study as multiple students in the experimental focus group found that using the flash-based vocabulary-oriented in-class online application was enjoyable. In this study, it was proven that by using technology in the class, student reading comprehension can be improved. Reading comprehension progression is reliant upon vocabulary progression (Quinn, Wagner, Petscher, & Lopz, 2015), and the flash-based vocabulary-oriented in-class online application utilized in the study is a vocabulary-based application. Students who utilized the online application improved 12% during the course of the study, compared to only 5% to those who were taught without using technology.

5.2 Online application obstacles

However, there were a few minor hindrances while using a flash-based vocabulary-oriented in-class online application in this study. First of all, a few students complained about the (flash-based vocabulary-oriented in-class online application) music, one student in particular stated that he "hated" the music. Another point to consider

is that when there is a room full of students trying to finish the flash-based vocabulary-oriented in-class online application, the music can be a bit disruptive. In the future, the researchers will either change the music of the flash-based vocabulary-oriented in-class online application or eliminate the music altogether. The next hindrance is that sometimes the flash-based vocabulary-oriented in-class online application will freeze up and then students have to start the game all over again from the very beginning. Although it seldom happens, this is an aspect of the flash-based vocabulary-oriented in-class online application that needs to be remedied. Since this study utilized a flash-based technology, it could only be played on computers, and it was not compatible on other platforms. Because of this fact, this study could only be done in a computer lab.

5.3 Limitations of the study

During the course of this study, the research subjects' English level was advanced, with a handful of students being actual native-English speakers or near-native level. The course the research subjects were enrolled in was the most advanced English course in this particular multicultural international college. Because of this fact, the reading comprehension improvement was handicapped due to the high English level of the students in the class. In subsequent research of this nature, the researchers intend to use research subjects with intermediate levels.

5.4 School infrastructure

The location of the study was conducted at a multicultural international college in Patumthani, Thailand, where all of the classrooms were equipped with overhead projectors, free Wi-Fi (for teachers and students), and sound systems. Although greater facilities may not be able to be found at other universities in the area, there were a few issues with the computers in the computer lab. First of all, it would be a good idea to update some of the computers in the computer lab, as not all the computers were completely functional. In addition to that, not all the computers in the computer lab had actual internet access. If future studies are to be conducted utilizing the current flash-based vocabulary-oriented in-class online application (which is reliant on the university's infrastructure), then these issues should be addressed.

6. Conclusion

In this study the researchers has presented the results of the research question by coming to a conclusion that using technology in the classroom can help improve reading comprehension skills. In addition, by focusing on the research objective, the findings of this study have come to the conclusion that, by using technology in the classroom, motivation can be increased and student truancy can be decreased.

6.1 Reading comprehension

Knowing a broad range of vocabulary does help reading comprehension (Hall, Greensburg, Laures-Gore, & Pae, 2014). In order to comprehend reading passages, it is vital to expand learners' understanding of vocabulary words, and the main predicament in reading comprehension for students is inadequate understanding of vocabulary words and various word combinations (Asmaa, Noorizah, & Zaini, 2015). Given those facts, this study implemented the use of a flash-based vocabulary-oriented in-class online application in order to improve student reading comprehension. When comparing the group that utilized technology in the classroom with that of the group that did not utilize technology in the classroom, the experimental group's reading comprehension results improved 12% as opposed to the control group's 5%.

6.2 Motivation

As observed in a similar study, when using technology in the classrooms, students seemed more engaged (Alresheed, Leask, & Raiker, 2015). Similarly, as observed in this study and in the student focus group, the students stated the flash-based vocabulary-oriented in-class online application was very good and fresh. One student commented that the flash-based vocabulary-oriented in-class online application was of "good quality". Furthermore, the results of the student vocabulary book proved that students were more motivated during the course of the study based on the fact that students utilizing technology in the classroom finished their homework 14.2% more of the time than the group that used traditional teacher methods.

6.3 Truancy

As stated earlier, utilizing online applications in the classroom can help decrease truancy (Meyer, 2015). Similarly, this study came to the same conclusion, as student truancy decreased 6.8% more in the experimental group when compared to the control group.

6.4 Future research

The researchers advocate that future research possibilities in the area of using technology in the classroom, can and should be conducted, but with two minor adjustments. Firstly, this study utilized a flash-based vocabulary-oriented in-class online application. Because of this fact, it could only be played on computers and not on other platforms such as tablets and mobile phones. The researchers propose for future studies that a similar in-class online application should be developed as a tablet-based application. At the university where the study took place, all in-coming students receive an iPad Air (included in their tuition). So if an iPad app was developed, future studies would not be reliant on the university's infrastructure. The other study modification that the researchers advocate has to deal with the research subjects. As stated earlier, the students in this study possessed an advanced English level, and because of this fact, the researchers assume their reading comprehension improvement was handicapped. So in future studies of this kind, the researchers are advocating research subjects with an intermediate English level, that way reading comprehension improvements could be better assessed. Educators need to be creative, acknowledge their students' curiosities, minimize their technological bias and take advantage of the use of technology in the classroom (Ersoy & Bozkurt, 2015). One of the research subjects in the researchers' focus group said it best: "The way moving forward is using more technology, but not in a way that distracts students".

7. References

Allsop, Y., Yildirim, E. Y., & Screpanti, M. (2013). Teachers' beliefs about game based learning: A comparative study of pedagogy, curriculum and practice in Italy, Turkey and the UK. *Proceedings of the 7th European Conference on Games Based Learning, 1*, 1-10.

Alodail, A. (2016). The instructors' attitudes toward the use of E-learning in classroom in College of Education at Albaha University. *Turkish Online Journal Of Educational Technology, 15*(1), 126-135.

Alresheed, S., Leask, M., & Raiker, A. (2015). Integrating computer-assisted language learning in Saudi schools: A change model. *Turkish Online Journal of Educational Technology, 14*(4), 69-77.

Asmaa, A., Noorizah Mohd, N., & Zaini, A. (2015). The effect of data driven learning on receptive vocabulary knowledge of Yemeni University learners. *3L; Language,Linguistics and Literature: Southeast Asian Journal of English Language Studies, 21*(3), 13-24.

Beserra, V., Nussbaum, M., Zeni, R., Rodriguez, W., & Wurman, G. (2014). Practising arithmetic using educational video games with an interpersonal computer. *Journal of Educational Technology & Society, 17*(3), 343-358.

Beydarani, V. (2015). The influence of concept mapping on reading comprehension of Iranian English students employing persuasive and descriptive texts. *Journal of Language Teaching & Research, 6*(1), 196-203. DOI: 10.17507/jltr.0601.24

Brosseuk, D. (2014). A new direction: Using mobile technology devices to motivate and engage boys in literacy learning. *Practically Primary, 19*(1), 17-21.

Carlson, E., Jenkins, F., Li, T., & Brownell, M. (2013). The interactions of vocabulary, phonemic awareness, decoding, and reading comprehension. *Journal of Educational Research, 106*(2), 120-131. DOI: 10.1080/00220671.2012.687791

Chunwadee, C., Unchalee, S., Angkana, T., & Niwat, S. (2015). Developing local curriculum framework on water resource and disaster course in the basic educational system. *Educational Research and Review,10*(16), 2216-2225. DOI: 10.5897/ERR2015.2277

Conefrey, T. (2016). Technology in the college classroom: Crisis and opportunity. *Educational Technology, 56*(4), 37-40.

Ersoy, A., & Bozkurt, M. (2015). Understanding an elementary school teachers' journey of using technology in the classroom from sand table to interactive whiteboard. *International Electronic Journal of Elementary Education, 8*(1), 469-488.

Fisher, D., & Frey, N. (2014). Content area vocabulary learning. *The Reading Teacher, 67*(8), 594-599. DOI: 10.1002/trtr.1258

Hall, R., Greenberg, D., Laures-Gore, J., & Pae, H. K. (2014). The relationship between expressive vocabulary knowledge and

reading skills for adult struggling readers. *Journal of Research in Reading, 37*(S1), S87-S100. DOI: 10.1111/j.1467-9817.2012.01537.x

Kelley, M. F., Roe, M., Blanchard, J., & Atwill, K. (2015). The influence of spanish vocabulary and phonemic awareness on beginning english reading development: A three-year (K-2nd) longitudinal study. *Journal of Research in Childhood Education, 29*(1), 42-59. DOI: 10.1080/02568543.2014.973127

Kim, H. J., Park, J. H. , Yoo, S., & Kim, H. (2016). Fostering creativity in tablet-based interactive classrooms. *Journal of Educational Technology & Society, 19*(3), 207-220.

Lamb, A., & Johnson, L. (2006). Flash: Engaging learners through animation, interaction, and multimedia. *Teacher Librarian, 33*(4), 54-56.

Lan, L., Worch, E., YuChun, Z., & Aguiton, R. (2015). How and why digital generation teachers use technology in the classroom: An explanatory sequential mixed methods study. *International Journal for the Scholarship of Teaching & Learning, 9*(2), 1-9.

Lane-Kelso, M. (2014). Got Game? Playing to learn in Omani education. *Proceedings of The European Conference on Games Based Learning, 2*, 818-820.

Levene, J., & Seabury, H. (2015). Evaluation of mobile learning: Current research and implications for instructional designers (abstract). *Techtrends: Linking Research & Practice to Improve Learning, 59*(6), 46-52. DOI: 10.1007/s11528-015-0904-4

Lineros, J. V., & Hinojosa, M. (2012). Theories of learning and student development. *National Forum of Teacher Education Journal, 22*(3), 1-5.

Lougheed, L. (2014). *Barron's practice exams with audio CDs: 2nd edition*. Hauppauge, NY, USA: Barron's Educational Series.

McClanahan, L. (2014). Training using technology in the adult ESL classroom. *Journal of Adult Education, 43*(1), 22-27.

McKeown, M. G., Crosson, A. C., Artz, N. J., Sandora, C., & Beck, I. L. (2013). In the media: Expanding students' experience with academic vocabulary. *The Reading Teacher, 67*(1), 45-53. DOI: 10.1002/TRTR.1179

Meyer, L. (2015). 4 Innovative ways to teach with video games. T H E Journal, 42(5), 20-24.

Mokhtari, K., & Niederhauser, D. S. (2013). Vocabulary and syntactic knowledge factors in 5th grade students' reading comprehension. *International Electronic Journal of Elementary Education, 5*(2), 157-169.

Nowell, S. D. (2014). Using disruptive technologies to make digital connections: stories of media use and digital literacy in secondary classrooms. *Educational Media International, 51*(2), 109-123. DOI: 10.1080/09523987.2014.924661

Quinn, J. M., Wagner, R. K., Petscher, Y., & Lopez, D. (2015). Developmental relations between vocabulary, knowledge and reading comprehension: A latent change score modeling study. *Child Development, 86*(1), 159-175. DOI: 10.1111/cdev.12292

Rehmat, A., & Bailey, J. (2014). Technology integration in a Science classroom: Preservice teachers' perceptions. *Journal of Science Education and Technology, 23*(6), 744-755. DOI: 10.1007/s10956-014-9507-7

Safitry, T. S., Mantoro, T., Ayu, M. A., Mayumi, I., Dewanti, R., & Azmeela, S. (2015). Teachers' perspectives and practices in applying technology to enhance learning in the classroom. *International Journal of Emerging Technologies in Learning, 10*(3), 10-14. DOI: 10.3991/ijet.v10i3.4356

Schaffhauser, D. (2013). Can gaming improve teaching and learning? (cover story). *T H E Journal, 40*(8), 26-33.

Spencer, R., & Smullen, T. (2014). Future reading: Using technology in the classroom. *Practically Primary, 19*(2), 28-31.

Suzuki, M., & Daza, C. (2004). A Review of the Reading Section of the TOEIC. *TESL Canada Journal, 22*(1), 16-24. DOI: https://doi.org/10.18806/tesl.v22i1.163

Trew, G. (2007). *A teacher's guide to TOEIC ® listening and reading test: Preparing your students for success*. Oxford University Press. Retrieved January 21, 2017, from https://elt.oup.com/elt/students/exams/pdf/elt/toeic_teachers_guide_international.pdf

Warren, M. C. (2016). Teaching with technology: Using digital humanities to engage student learning (abstract). *Teaching Theology & Religion, 19*(3), 309-319. DOI: 10.1111/teth.12343

Wistner, B., Sakai, H., & Abe, M. (2009). An analysis of the Oxford Placement Test and the Michigan English Placement Test as L2 proficiency tests. *Bulletin of the Faculty of Letters, Hosei University, 58*, 33-44. https://www.hosei.ac.jp/bungaku/museum/html/kiyo/58/articles/Wistner.pdf