

The Impacts of Using Interactive E-book on the Learning

Effectiveness of English blank-filling cloze

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Abstract: *This study used interactive e-book in English instruction and explored its benefits as well as negatives of 9th grader students' learning achievements in the English blank-filling cloze test. A questionnaire is used to investigate students' "perceived usefulness" and "perceived ease of use" toward using the interactive e-book in learning English. To find out the effects of using interactive E-book on English blank-filling cloze test, a four-lesson experiment was conducted in the English course in a junior high school. The experimental results show that although the students using interactive e-book did not outperform the ones receiving conventional instruction in learning English, the statistical feedbacks in terms of "perceived usefulness" and "perceived ease of use" on the questionnaire showed that the students highly appreciated and accepted the interactive e-book learning activity.*

Keywords: e-book, blank-filling cloze test, learning achievement, perceived usefulness, perceived ease of use

1. Background and objectives

1.1 Introduction

In the exam-oriented society, English is crucial for Taiwanese students. It is not only the first foreign language they learned in elementary school but also the fundamental key to successfully entering their ideal schools. What your English skill level is seems to be a significant qualification that everyone has to concern for studying or job-applying. With the state-of-the-art technology development, learners' learning habits change. The prosperity of the Internet and the trend of online application alter the traditional way people acquire the information thoroughly. Moreover, the new-generated knowledge revolution in reading and publishing shows that reading is not just reading, and books are not just books. Thus, the paper-texted books have been transformed into digital materials. To cater readers' multiple tastes, digitalizing the reading materials has been taken for granted.

People born from the mid- 1990s to 2000s are called “Z generation,” or “the Internet Generation.” Most of them grow up in a technology-surrounded environment and they have plenty of chances to obtain abundant multimedia information. Among them, electronic picture books, a kind of literature in digital format edited for children to read, are included. (De Jong & Bus, 2002; Korat, 2009) Some scholars pointed out using educational electronic book as a tool can support children’s literacy. Learning from a familiar electronic book makes students close to their own learning styles.

However, the e-books not only have digital characteristics to make students more attentive, but also have various interactive ways to promote readers’ reading effectiveness (De Jong & Bus, 2003, 2004). On the other hand, some scholars pointed out that we should encourage teachers in the language field use computer technology combining teaching strategies to improve the negative reading effectiveness (Adam & Wild, 1997).

1.2 Purpose of this study

As for the academic subject, English, the level for senior high is much higher than it for junior, especially in the numbers of recognized words. The learning gaps make freshmen who just attend senior high frustrated. In addition, lots of students claim that they can hardly find the key points to answer the English blank-filling close test.

The researchers for this project are both high school English teachers. According to the curriculum plan by The Ministry of Education in Taiwan, junior high school students need to know 1200 basic words and 2000 advanced words. Furthermore, 7000 recognized words for senior high school students. Thus, we decided to teach students the words formation rules. In other words, we show them the concept for distinguishing prefixes, roots words and suffixes. We are looking forward to helping students memorize new words by decomposing English words and lightening their learning burdens.

The teaching material adopted from the senior high English textbook, New Fareast version by Professor Chen Chunyin. In accordance with the schedule, we focus on Book 1 Lesson 7 (Into Aesop’s World). Meanwhile, we make some extension to teach students the general rules to distinguish the morphological features and make introductions about some common slang about animals. Within the teaching process, we make use of the interactive characteristic of E-books to promote students’ learning motivation and intensify their learning effect. What we do makes students pay less effort but achieve more. Most important of all, it can lower the cognitive loads and mental efforts.

The English blank-filling cloze test is considered tougher than any other part in the English test. To get high score, students have to recognize the words, the morphological features and idioms. The coherence between semantics and syntax is important as well. Consequently, in this study, an experiment has been conducted on the “the impact of using

interactive e-book on English blank-filling close test.” To evaluate the effectiveness of the proposed approach, the following research questions are investigated.

- (1) Does the interactive e-book learning have negative or positive impact on the learning achievements of the students?
- (2) Do the students who learn with the interactive e-book highly perceived usefulness and perceived ease of use?

2. Literature review

2.1 e-books

By means of the specialty of the computer multimedia, e-books including learning materials like texts, pictures, voices, videos and animations give readers a whole new reading experience. The so called e-books don't necessarily have the form of “books”, but using all types of screen devices to combine specific software reading the digital contexts. They are in place of the traditional paper reading in the past.

The main purpose of the e-book topic aims to make students utilize this e-book to review after school on their own. Moreover, researchers look forward to making all students understand the learning contents by themselves. Diminishing the uneven educational development like “twin-peak” phenomenon and shortening the urban-rural gaps of the students' learning achievements are the researchers' top priorities.

Basically, the e-books are divided into two categories. One is for Reading Only and the other is for Reading and Playing. The former one focus on pronunciation of the whole article, but lacks of interactive games. On the contrary, Reading and Playing provides interactive games, multimedia effects and all kinds of animations. By clicking the hyperlink, readers have lots of chances to practice reading skills. (De Jong & Bus, 2003) This study belongs to the category of Reading and Playing. Inclusive of animations and multimedia effects, the e-book combining learning materials and interesting games makes students impressed while learning and motivates their learning interests.

2.2 Interactive multimedia teaching

Based on the instructional quality of the interaction, Misanchuk and Schwier (1992) identified three levels of interaction, namely reactive, proactive, and mutual interactions. (1) A reactive interaction: It is a response to a given question. Using the repetitious practices help learners to construct basic concepts. (2) Proactive interaction: According to learners' learning experiences, the system makes examples to help them interpret the concepts and present the learning materials in an understandable way. Learners can adopt the hierarchical structure as the most appropriate approach and enjoy the freedom to read the content wholly or partially. (3) Mutual interaction: In a mutual interaction environment,

the learner and system are mutually adaptive in reactions with each other. Based on the data that the learners imported, the system will classify the thinking patterns of the learners and arrange suitable learning environment for learners to choose from under different learning situations. Besides, the system will show the consequence of different options. Through these constructive advices, learners read in an appropriate environment.

This study is in the form of reactive interaction. Researchers use teaching games and multimedia effects within the e-book like familiar topics and pictures to help learners practice repeatedly and acquire the concept constructively.

In sum, the main purpose of this study is to help learners to learn through the e-book anywhere, anytime without the assistance of others. Not limited to school time or any learning field. As long as the learners want to learn, he can download the e-book that he needs immediately. In this way, students' learning will be neither interrupted nor limited. Researchers hope that every student can study independently and be comprehensive about the learning materials through the e-book. Most important of all, improving the "twin-peak" phenomenon and shortening the urban-rural gaps of the students' learning achievements can solve the uneven distribution of the teaching resources and human resources problem.

3. Experiment design

3.1 Participants

The subjects included two classes of 9th graders of a private high school in New Taipei City, Taiwan, R.O.C. A total of 109 students voluntarily participated in the study. One class was assigned to be the experimental group and the other was the control group. There are 54 students in the experimental group, who use interactive e-books to learn, while there are 55 students in the control group, who learn by the traditional way of the lecture and the worksheets. The average age of the subjects was 15. The experiment was conducted in the Advanced Placement English course. All of the students were taught by the same instructor who had taught the English course for over 10 years.

3.2. Instruments

The learning achievement test was developed by two experienced teachers. The questions in the test sheets were adapted from the teaching material in class. The pre-test scores were collected from the blank-filling cloze test in the weekly test student already took before the learning activity. The pre-test aimed to evaluate students' prior knowledge toward the blank-filling cloze test. The study collected 6 times of the scores. Every test consisted of five multiple choice questions, and each question accounts for 1 point, with a total of 6 times of the scores of 30. The post-test was 30 questions, and each question

accounts for 1 point, with a total of the scores of 30. The post-test aimed to evaluate the students' learning achievement in the learning activity.

The questionnaire used to evaluate students' "perceived usefulness" and "perceived ease of use" was adapted from Chu, H. C., Hwang, G. J., Tsai, C. C., & Tseng, Judy C. R. (2010) using a six-point Likert rating scheme. The questionnaire included 9 items, such as "I think it is helpful to use this kind of learning mode when learning something new."; "I don't need to spend too much time or energy during the learning process"

3.3. Experimental Procedures

Before the experiment, the two groups of the students took a pre-test, which was a regular part of the test every week. During the learning activity, the students in the experimental group learned with the interactive e-books, while the students in the control group learned with the conventional way of lecture and the worksheets. It was worth mentioning that the way with which the control group learned was just the way they used to do. That is, the students in the control group reflected the way students' learned with conventional paper-based instruction before. The whole teaching procedure lasted for 4 periods of the class in a total of 200 minutes.

After the learning activity, students took the post-test and completed the questionnaire of the "perceived usefulness" and "perceived ease of use" to evaluate students' learning achievement and their perceptions toward the "perceived usefulness" and "perceived ease of use".



Figure 1. (Left) A page of the interactive e-books for the experimental group;
(Right) A page of worksheets for the control group.

4. Research results

4.1. Analysis of learning achievements

The purpose of this study was to examine the impact of using interactive e-book on

English blank-filling cloze test. The pretest scores of the two classes are not significant ($t = 1.20$; $p > .05$). After the independent t-test on the post-test ($t = 0.87$; $p > .05$), the results still showed no significant differences in test scores between two groups. Consequently, this study implied that the junior high school students using e-book to instruct foreign language could not make sure to outperform those using paper-based instruction when learning the blank-filling cloze.

Table 1. t-test of the pretest and post-test

Group	N	Pre-test			Post-test		
		Mean	SD	<i>t</i>	Mean	SD	<i>t</i>
Experimental group	54	16.15	6.12	1.20	11.78	7.16	0.87
Control group	55	14.53	7.90		10.58	7.24	

4.2. Analysis of “perceived usefulness” and “perceived ease of use”

In order to understand students’ “perceived usefulness” and “perceived ease of use” toward interactive e-books, the study utilized a questionnaire to evaluate. As shown in Table 2, the average perception of the “perceived usefulness” of the experimental group was 4.28 out of a Likert 6-point scale, it meant students hold a positive attitude towards the “perceived usefulness”; and the average “perceived ease of use” of the experimental group was as high as 4.21 out of a Likert 6-point scale, showing the students generally agreed that interactive e-book is easy to operate. To sum up, the study results suggest that students' hold a positive attitude toward learning with interactive e-books. Although the learning effectiveness of using e-books in practicing blank-filling cloze was not significantly better than the learning effectiveness of paper-based instruction, the students were willing to accept new technology in language learning. Therefore, future learning will not be limited in paper-based instruction.

Table 2. Descriptive data of “perceived usefulness” and “perceived ease of use”

Category	N	Mean	SD
perceived usefulness	54	4.28	0.74
perceived ease of use	54	4.21	0.85

5. Discussions and conclusions

This study integrates the interactive e-books into English teaching, hoping to assist students’ skills in answering questions in the English blank-filling cloze test. It expected that the effectiveness of learning English blank-filling cloze could be not decreased due to the interference of electronic media. The experimental results of this study found that the

learning achievement of e-book instruction was as good as paper-based instruction. There was no significant difference between the e-book instruction and paper-based instruction. Furthermore, the students' feedback from the questionnaire shows that interactive e-book really enhance students' interest in learning English. The students in the experimental group highly perceived usefulness and ease-of-use on average. Through the operation of e-books and educational games, students look forward to each page of the e-books and anticipate the surprise the books bring to them. During the experimental process, the researchers find that students, even the low-achievers who were easily doze off in class, actively participate in classroom activities with the help of the e-books.

The pictures and games embedded in the e-books succeeded attracting the attention of students, allowing them to reveal a pleasant smile in the learning process, and hence the atmosphere in the classroom is happy and harmonious. Integrating technology into teaching create a win-win situation for both teacher and students. Although due to limited funds and manpower, students cannot hold and operate a Tablet PC individually to use e-books this time, yet this interactive e-books system truly presents the learner-centered, teacher-assisted blueprint. Students think jointly the content of e-books, discussing with each other, and giving immediate feedback. All these improve the learning outcomes and the classroom atmosphere. After school, students can also download e-books to do the review or preview from the cloud space.

Although the subjects were all from high school Advanced Placement classes, those students still have to prepare the Comprehensive Assessment Program for Junior High School Student. These subjects may therefore like candles burning at both ends; they cannot very well prepare the high school curriculum. Thus, the learning achievement research results are not significant. However, feedback from the questionnaire which shows that considering the “perceived usefulness” and “perceived ease of use”, the experimental group highly approved and accepted interactive e-books. Nevertheless, the main limitation of this study is the time limitation. Because graduation ceremony and educational examinations are around the corner, the experiment cannot last long. The study recommends that for the future study, the experiment time may require a month at least, the effectiveness will be more obvious.

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6. References

- Adam, N. and Wild, M. (1997). Applying CD-ROM interactive storybooks to learning to read. *Journal of Computer Assisted Learning*, 13, 119-132.
- De Jong, M.T., & Bus, A.G. (2002). Quality of book-reading matters for emergent readers: An experiment with the same book in a regular or electronic format. *Journal of Education Psychology*, 94(4),145-155.
- De Jong, M.T., & Bus, A.G. (2003) How well suited are electronic books to supporting literacy?. *Journal of Early Childhood Literacy*, 3(2), 147-164.
- De Jong, M.T., & Bus, A.G. (2004). The efficacy of electronic books in fostering kindergarten children's emergent story understanding. *Reading Research Quarterly*, 39(4), 378-393.
- Korat, O. (2009). Reading electronic books as a support for vocabulary, story comprehension and word reading in kindergarten and first grade. *Computers and Education*, 55, 24-31.
- Korat, O., & Shamir, A. (2012). Direct and indirect teaching: Using e-books for supporting vocabulary, word reading, and story comprehension for young children. *Journal of Educational Computing Research*, 46(2), 135-152.
- Kynaslahti, H. (2003) In Search of Elements of Mobility in the Context of Education. *Mobile Learning* (eds. H. Kynaslahti & P. Seppala) , 41- 48.
- Misanchuk, Earl R.; Schwier, Richard A. (1992) Discusses audit trails (i.e., records of learner responses) in interactive multimedia and hypermedia instruction. *Journal of Educational Multimedia and Hypermedia*, v1 n3 , 355-72.
- Pinkwart, N. & Hoope, H. U. & Milrad, M. & Perez. J. (2003). Educational scenarios for cooperative use of Personal Digital Assistants. *Journal of Computer Assisted Learning*, 19, 383-391.