

A preliminary study of strategy-based e-book reading system for elementary school students

Yu-Cheng Chien, Yen-Ning Su & Yueh-Min Huang*

Department of Engineering Science, National Cheng Kung University, Taiwan

*huang@mail.ncku.edu.tw

Abstract: Recently, life has been not be separated with information technology. Meanwhile, information technologies are also play an important role in all aspects. In the applications of learning and education, it is more an indispensable part. Hence, applying information technology into educations has received much attention by many researchers. Among them, the e-book especially to be received the many expectations. Restated, this study review many related teaching, reading and other literature. However, only a minority of the studies consider reading strategies. Hence, we were a according above literature to propose a framework of strategy-based e-book reading system to enhance approach of teaching and learning. In the future, we will gradually develop this system and try to incorporate into the teaching and learning.

Keywords: Reading strategy, E-book, Reading instruction, Elementary school students.

1. Introduction

Recently, since the development of information technology and germination of innovative teaching philosophy, there are many classes of promote e-learning related research in the real world and have received much attention by researchers. Hence, educators should be by creating a rich learning environment, the implementation of diverse teaching strategies. There are a number of scholars dedicated to research of digital learning, such as study of digital learning theory (Hwang, Tsai, & Yang, 2008), teaching strategies and build of digital learning environment (Chu, Hwang, Tsai, & Tseng, 2010; Hwang, Chen, Tsai, & Tsai, 2011; Tsai, Lin, & Yuan), the impact of emerging technologies for learning (Huang, Liang, Su, & Chen, 2012; Sung, Chang, Hou, & Chen, 2010), planning and analysis of digital learning content (Chang, Wu, Weng, & Sung, 2012) and information literacy and information ethics (Chou & Peng, 2011).

On the other hand, the applications of e-books are also subject to many expectations and concerns on education since the development and boom of e-books in recent years. At present, many studies try to integrate into e-books in teaching practice to investigate the impact of e-books for teaching and learning (Huang et al., 2012; Korat, 2010; Korat & Shamir, 2008; Scheidlinger, 2004; Shamir, Korat, & Barbi, 2008; Shamir & Shlafer, 2011; Wilson, 2003; Woody, Daniel, & Baker, 2010). Huang et al. (2012) through the demand analysis of expert teacher to develop an e-book reading system for the reading curriculum in elementary school. Meanwhile, the trial of the system through the elementary school grades 1 to 6 students for the e-book reader and according to the opinions of the students use for e-books as the correction direction. The results show that students felt that middle-upper-satisfaction of reading function of the e-book system.

Grimshaw, Dungworth, McKnight, and Morris (2007) explore the 132 elementary school students use e-book and paper to read a story book, and finding impact of reading

comprehension through assisted of dictionary. Its findings, the students use e-books and read through the online dictionary, the reading comprehension was significantly better than reading the story book use paper with tradition dictionary. Korat (2010) studied the effect of vocabulary learning and reading ability for kindergarten students. The results show that the e-book does have a positive role in helping to enhance the ability of vocabulary and reading for children to learning. Korat and Shamir (2008) study 149 elementary school students to explore the impact of e-book reading comprehension. The results show that e-books have a positive benefit for the students' reading comprehension. Shamir et al. (2008) through the e-books into the learning activities to understand the kindergarten children to read e-books will have an impact on their reading ability. The study found that e-books into the learning activities can really enhance students' reading ability.

According to summary of stated above, digitization of the dissemination of knowledge has become one of the important sources of the children to learn and absorb new knowledge in recent years. Meanwhile, since the development of emerging technologies, various equipment functions than traditional tool is more diverse and easy to use. Hence, how to understand the features of emerging technologies and explore its application in teaching and learning has become an important issue. And then, through the above literature review, in the past have been many researches to investigate influence of e-book into teaching for students' learning. Its majority of results are believed that the e-books into teaching do have a positive effect on students' learning (Korat, 2010; Korat & Shamir, 2008; Shamir et al., 2008). However, most researches aimed at “development of e-book system and software” and “e-books integration into the teaching for influence of student reading ability”.

Hence, in the current e-book boom, supposing researchers can draw on the advantages of e-book to try reading strategies integration into the function of e-book. And then, as a tool to assist students can be use of reading teaching and learning strategies, which should be able to be helpful for enhancing the reading ability of elementary school students, thereby promoting the students to engage in meaningful learning.

2. E-book integration into the teaching of reading

In previous studies, there are many researchers try to use e-books as the intellectual content of the carrier, thereby to provide students for learning (Bennett, 2011; Grimshaw et al., 2007; Korat, 2010; Korat & Shamir, 2008; Ohene-Djan, Zimmer, Gorle, & Naqvi, 2003; Scheidlinger, 2004; Shamir et al., 2008; Shamir & Shlafer, 2011; Wilson, 2003). Since the studies explore the direction of the differences, that is, the object of its implementation is different, such as child care (Korat, 2010; Korat & Shamir, 2008; Shamir et al., 2008), elementary school students (Grimshaw et al., 2007; Korat, 2010; Korat & Shamir, 2008; Shamir et al., 2008), secondary and tertiary students (Wilson, 2003; Woody et al., 2010). The following research eBook integrated into the purpose of reading instruction, methods and research findings are described.

Korat and Shamir (2007) study 128 kindergarten students to use the e-book into the way of teaching. The children through the e-book to read the text specified by the teacher to understand students learn to read and literacy abilities by e-book. The results of experiment showed that, reading e-book children know the vocabulary test from the scores significantly higher than the control group of children. Korat and Shamir (2008) through kindergarten students for the study, the study aims to explore e-books into the reading instruction of students reading ability and vocabulary ability. The results show that the read multimedia e-book does have a positive role in helping to enhance young children's

reading ability and vocabulary ability. Shamir et al (2008) investigate effect of read e-book for children literacy skills. The study results show that the multimedia capabilities of the e-book auxiliary can help to improve the literacy skills of children. Korat (2010) explore children of different ages (5-8 years old children) through integration into the teaching of reading the e-book. The results show that, children of different age's ability of vocabulary, reading and comprehension were highly growth state. Grimshaw et al. (2007) according to elementary school students as the object of study to understand text reading comprehension of students through e-books and print books into the reading activities. The results showed that reading e-books with multimedia features to really enhance students' interest in reading, and can effectively improve their reading comprehension. The study of Kang et al. (2009) not only explore different reading media students' visual fatigue effects, but also to study more about different media (e-books and paper books) for students to read the text. The results show that, regardless of reading e-books or print books, the correctness of the junior college students read the text was no significant difference.

Table 1. Related studies of e-book integration into the teaching of reading

Author	Year	Participants	Findings
Korat and Shamir	2007	kindergarten students	Reading e-book children know the vocabulary test from the scores significantly higher than the control group of children.
Korat and Shamir	2008	kindergarten students	Read multimedia e-book does have a positive role in helping to enhance young children's reading ability and vocabulary ability.
Shamir et al.	2008	kindergarten students	The multimedia capabilities of the e-book auxiliary can help to improve the literacy skills of children.
Korat	2010	elementary school students and kindergarten students	Children of different age's ability of vocabulary, reading and comprehension were highly growth state.
Grimshaw et al.	2007	elementary school students	Reading e-books with multimedia features to really enhance students' interest in reading, and can effectively improve their reading comprehension
Kang et al.	2009	Junior college students	Regardless of reading e-books or print books, the correctness of the junior college students read the text was no significant difference.

For the foregoing review of the literature can know e-books for different age groups of students reading comprehension, literacy, reading ability has a positive impact. The majority of researches summarized the induction of possible causes for the e-book multimedia capabilities function are capable to more interactive and to stimulate and thus affect student learning. Therefore, how can we grasp the advantages of e-books for reading instruction for students is necessary, and reading comprehension strategies to integrate into the accessibility of the e-book will also be worthwhile to delve into the question. Additionally, we will need to further explore reading comprehension strategies into the e-book function related demands, and to look forward to emerging technology is merging with the connotation of education. Thus enhance students' reading comprehension ability.

3. Reading instruction and reading comprehension strategies

The reading is an initiative mental activity (Goodman, 1982), which also are important basic skills for people accept the message and self-learning (Glover, Rorning, & Bruning,

1990). Rubin (1980) mentioned that reading is a complex and dynamic process. The readers according to reading the contents to self-definition, and also from reading the content obtain the defined. Last the readers through self-conclusions to read the content of meaning. As stated above, we can know the reading is an essential ability for learning and absorb knowledge. Therefore, the reading ability and training cannot via a lot of reading reached target. But it involves the reader's own reading strategies to master.

Goodman (1993) further mentioned that the efficiency of reading activities is not intensive to reading every single word. But the reader can find the complex wording is important keyword phrases, and in the process of reading to grasp the main point of the article. Therefore, comprehend and mastery of reading is not a fragment, but through the use of reading comprehension strategies to make themselves able to grasp the meaning of the article.

Currently, there are many studies try to use different reading strategies to enhance students' reading comprehension. Mol, Bus and de Jong (2009) the aim is understand the impact of interactive reading vocabulary and reading comprehension of elementary school students. The results show that, interactive reading vocabulary and reading comprehension of students do have a positive role. Blewitt, Rump, Shealy, and Cook (2009) explore through question and shared reading strategies to understand the implementation of strategies for reading comprehension and vocabulary learning for elementary school students. The studies have shown, reading strategies and questioning strategies to promote students' the development of reading comprehension and vocabulary learning ability.

According to above researches can know mastery of reading comprehension strategies is indeed an important tool in influencing student learning. Now, mastery of reading comprehension strategies is indeed an important tool in influencing student learning. Now, advanced information technologies apply into e-books can capable of train students for mastery of reading comprehension strategies to enable them to become a mastery of reading. Namely, this is an important and worthy of further exploration on the issue.

4. The framework of strategy-based e-book reading system

Based on the foregoing review of the literature, we can able to understand the related demand of e-book integration into the teaching of reading. This study explored a number of levels of reading strategies as a reference of future research in development of strategy-based e-book reading system. And thus deepen the application of e-books on the teaching of reading. Hence, this study proposes a framework of strategy-based e-book reading system to enhance approach of teaching. Restated, the following were description of direction of development and feature suggestions in the strategy-based e-book reading system (shown in Fig.1).

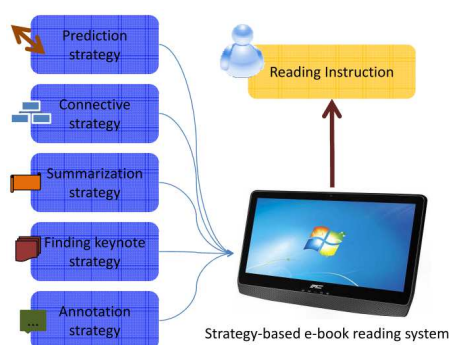


Figure 1. The framework of strategy-based e-book reading system

- Prediction strategy: the readers will read the article according to the reader's own prior knowledge to speculate that the development of the content of the article. This strategy allows students to remember the article content with their own prior knowledge, as well as to assess the content of the article through text information.
- Connective strategy: the readers' experience and content of the article, as well as links between the contents of the article. Its major can help students to arouse and the topic-related experience and mastery of conjunctions of link textual or paragraph to make the students familiar with the structure of the whole of the article.
- Summarization strategy: after the readers to read the article, the important message of the article through the enrichment of the integration to formation of the article the subject of a brief description. Summarization strategy to contain the operation of meta cognition, students plan, monitor and adjust, which is able to promote their understanding of the content of the article.
- Finding keynote strategy: through the readers to grasp the main point of paragraph to the effect and distinguish the importance of events. The last link uses important message to extract the core information in the various paragraphs.
- Annotation strategy: this strategy is a complex cognitive process, which involving the input and output of the readers of the information. Since taking notes involving student conduct a deep analysis of the article material. Hence, this approach can meaningful organization of the course of the article material to improve children's memory, which understanding and knowledge of the contents of the reservation.

According to above connotation for the reading strategies and the corresponding function, we will summarize the proposed architecture as the basis of the strategies function as the development of various types of reading.

5. Conclusion

In this study, we through the review of e-books integration into the reading teaching and other related literature. We thus further proposed a direction of development of strategy-based e-book reading system. In the future, we will gradually develop this system and try to incorporate into the teaching and learning. And then, we will use this system to understand whether this system will help to enhance reading comprehension skills of elementary school students. Restated, we intend attempts to multiple reading strategies assisted features incorporated into reading instruction to explore its impact on elementary school students reading comprehension.

In the future, more studies can moving toward the appropriate nature of e-book reader to understand the system of development, such as the students' reading behavior and the content of e-book concept analysis to understand the status of students reading strategies. Meanwhile, according those functions provide appropriate reading strategies to guide and appropriate reading materials. Additionally, assume the intelligent agent technology to provide interactive e-book as a tool to guide students to read. This way of function can able to enhance students' reading motivation and fun, which is worthy of further understanding and exploration.

Acknowledgements

This work was supported by the National Science Council (NSC), Taiwan, ROC, under Contracts No. NSC 100-2631-S-006-002, NSC 100-2511-S-006-014-MY3, and NSC 101-2511-S-041-001-MY3.

References

- [1] Bennett, L (2011), "Ten years of e-books: a review". *Learned Publishing*, vol. 24, 222-229. doi: 10.1087/20110310.
- [2] Blewitt, P., Rump, K. M., Shealy, S. E., & Cook, S. A (2009), "Shared Book Reading: When and How Questions Affect Young Children's Word Learning," *Journal of Educational Psychology*, vol. 101, 294-304.
- [3] Chang, K.-E., Wu, L.-J., Weng, S.-E., & Sung, Y.-T (2012), "Embedding game-based problem-solving phase into problem-posing system for mathematics learning," *Computers & Education*, vol. 58, 775-786. doi: 10.1016/j.compedu.2011.10.002
- [4] Chou, C., & Peng, H (2011), "Promoting awareness of Internet safety in Taiwan in-service teacher education: A ten-year experience," *The Internet and Higher Education*, vol. 14, pp. 44-53. doi: 10.1016/j.iheduc.2010.03.006
- [5] Chu, H.-C., Hwang, G.-J., Tsai, C.-C., & Tseng, J. C. R (2010), "A two-tier test approach to developing location-aware mobile learning systems for natural science courses," *Computers & Education*, vol. 55, pp. 1618-1627. doi: 10.1016/j.compedu.2010.07.004.
- [6] Glover, J. A., Rorning, R. R., & Bruning, R. H (1990), "Cognitive psychology for teachers," New York: Macmillan Publishing Company.
- [7] Goodman, K. S (1982), "A psycholinguistic guessing game," In F. V. Gollasch (Ed.), *Language and literacy*. London: Boston.
- [8] Goodman, K. S (1993), "Phonics phacts," Portsmouth, NH: Heinemann.
- [9] Grimshaw, S., Dungworth, N., McKnight, C., & Morris, A (2007), "Electronic books: children's reading and comprehension," *British Journal of Educational Technology*, vol. 38, pp. 583-599.
- [10] Hwang, G.-J., Chen, C.-Y., Tsai, P.-S., & Tsai, C.-C (2011), "An expert system for improving web-based problem-solving ability of students," *Expert Systems with Applications*, vol. 38, pp. 8664-8672. doi: 10.1016/j.eswa.2011.01.072.
- [11] Hwang, G.-J., Tsai, C.-C., & Yang, S. J. H (2008), "Criteria, Strategies and Research Issues of Context-Aware Ubiquitous Learning," *Educational Technology & Society*, vol. 11, pp. 81-91.
- [12] Huang, Y. M., Liang, T. H., Su, Y. N., & Chen, N. S (2012), "Engaging and empowering individual readers with an interactive e-book reading system," *Educational Technology Research and Development*, vol 60, pp.703-722.
- [13] Kang, Y.-Y., Wang, M.-J. J., & Lin, R (2009), "Usability evaluation of E-books," *Displays*, vol. 30, pp. 49-52.
- [14] Korat, O., & Shamir, A (2008), "The educational electronic book as a tool for supporting children's emergent literacy in low versus middle SES groups," *Computers & Education*, vol. 50, pp. 110-124.
- [15] Korat, O (2010), "Reading electronic books as a support for vocabulary, story comprehension and word reading in kindergarten and first grade," *Computers & Education*, vol. 55, pp. 24-31.
- [16] Korat, O., & Shamir, A (2007), "Electronic books versus adult readers: effects on children's emergent literacy as a function of social class," *Journal of Computer Assisted Learning*, vol. 23, pp. 248-259.
- [17] Mol, S. E., Bus, A. G., & de Jong, M. T (2009), "Interactive Book Reading in Early Education: A Tool to Stimulate Print Knowledge as Well as Oral Language," *Review of Educational Research*, vol. 79, pp. 979-1007.
- [18] Ohene-Djan, J., Zimmer, R., Gorle, M., & Naqvi, S (2003), "A personalisable electronic book for video-based sign language education," *Educational Technology & Society*, vol. 6, pp. 86-99.
- [19] Rubin, D (1980), "The teachers' handbook of reading/thinking exercises," New York: Holt, Rinehart & Winston.
- [20] Scheidlinger, Z (2004), "The E-book vs. the ordinary book," *Educational Technology & Society*, vol. 7, pp. 1-5.
- [21] Shamir, A., Korat, O., & Barbi, N (2008), "The effects of CD-ROM storybook reading on low SES kindergarteners' emergent literacy as a function of learning context," *Computers & Education*, vol. 51, pp. 354-367.
- [22] Shamir, A., & Shlafer, I (2011), "E-books effectiveness in promoting phonological awareness and concept about print: A comparison between children at risk for learning disabilities and typically developing kindergarteners," *Computers & Education*, vol. 57, pp. 1989-1997.
- [23] Sung, Y.-T., Chang, K.-E., Hou, H.-T., & Chen, P.-F (2010), "Designing an electronic guidebook for learning engagement in a museum of history," *Computers in Human Behavior*, vol. 26, pp. 74-83. doi: 10.1016/j.chb.2009.08.004.
- [24] Tsai, C.-C., Lin, S. S. J., & Yuan, S.-M (2002), "Developing science activities through a networked peer assessment system" *Computers & Education*, vol. 38, pp. 241-252. doi: 10.1016/s0360-1315(01)00069-0.

- [25] Wilson, R (2003), "Ebook readers in higher education," *Educational Technology & Society*, vol. 6, pp. 8-17.
- [26] Woody, W. D., Daniel, D. B., & Baker, C. A (2010), "E-books or textbooks: Students prefer textbooks," *Computers & Education*, vol. 55, pp. 945-948.