

Improve Students' Reading by Taking a Question-Based Learning Process on E-books

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Abstract: This study developed a question-based learning process embedded on an e-book to help students' textbook reading. We designed three reading phases: preview, reading, and review according to the reading strategy. In each phase, students were assisted by different questions. To evaluate the effect, we used this e-book in an experiment involving twenty-five students studying on a textbook content of computer science. Our research objectives are to test the effects of the system on academic performance and to evaluate whether the system use affects learner's motivation and active reading.

Keywords: questions; reading; e-book; learning process

Introduction

Questions in a textbook are generally provided in each chapter. An author may place preview questions at the beginning of a chapter to tell the reader what they will encounter and review questions at the end to improve their memory of the chapter. However, there are some issues with this book editing style: First, a chapter scope may be too large, and readers cannot remember excessive knowledge; as a result, they have difficulties to answer those questions. Second, different reading procedure may require different types of question. Structured questioning strategies significantly affect text memory and text learning [1]. On the other hand, teachers may have a requirement to ask their own questions to students. Even students may also want to bring up their questions. Thus, how to put the suitable question in each reading procedure is the second issue.

Therefore, this study attempts to address the above issues by adding a question-based auxiliary tool into a textbook. In addition, because of e-book's controllable characteristics and its increasing popularity, we digitally build the auxiliary tool. In summary, this paper brings up a question-based learning process educational e-book system for a solution.

1. Related work

1.1 Questions in Learning

A teacher ask question in a classroom to develop interest and motivate students, to evaluate students' preparation, to develop critical thinking skills and inquiring attitudes, to review and summarize, and to nurture insights by exposing new relationships [2]. Some researches summarized that high-quality learning includes mastery of content, understanding of concepts, and development of explicit strategies for asking good questions and exploring

new ideas [3]. Answering questions during a lecture can encourage students to engage some cognitive processes like organizing what they have learned, mentally integrating it with other knowledge, and a need to pay attention in what they are learning [4].

1.2 Reading with Questions

This study aims to use questions to help students reading. Questioning is a cognitive scaffolding assistance to stimulate and guide learning [5]. It is undoubted that question induce meaningful processing facilitate reading [6]. A research found that reading guided by questions is better in immediate recall and delayed recall than careful reading and re-reading without questions [7]. Some educators thought that students should be encouraged to develop as independent readers by asking their own questions in order [8]. Self-generation of questions during study can lead to improved performance on a test of comprehension [9].

2. System Design

2.1 Question-based Learning Process in E-book

Our study divided question-based reading process into three preview-read-and-review phases. A “QA-format” e-book was designed for users to be able to add question dynamically with scaffolding for a prescribed reading process. The system has three steps in a reading phase: preview, read, and review.

In the preview phase, students can read questions about the knowledge structure of the section they will meet.

In the reading phase, students can see questions by the side of textbook content in each page. These questions were asked by other readers who has read this page before. The system also provides a function to add comment to the existing questions. The purpose this step is to improve students’ motivation and chance of reconsideration.

Finally, the review phase provides questions to evaluate what they have digested. Similar to the preview step, questions were created by teachers. In this step, a student can reflect on how well they have understood the author’s ideas.

2.2 System Description

For portability, a “QA-format” e-book is web-based application software. Students can read the e-book on any device that supports network and web browser. The e-book contains two kinds of screen: home page and content page.

Home page (Fig. 2) lists all names of chapters and sections in the book and presents the contents in a hierarchical tree structure. In the content page (Fig. 2), the screen is divided into four parts: tool bar, question area, comment area, and textbook content.

Tool bar is on the top of page, it shows the user identity, number of questions, button of creating a new question, and button to look preview questions again. The remaining areas outside the toolbar from top to bottom are questions, contents, and comments.

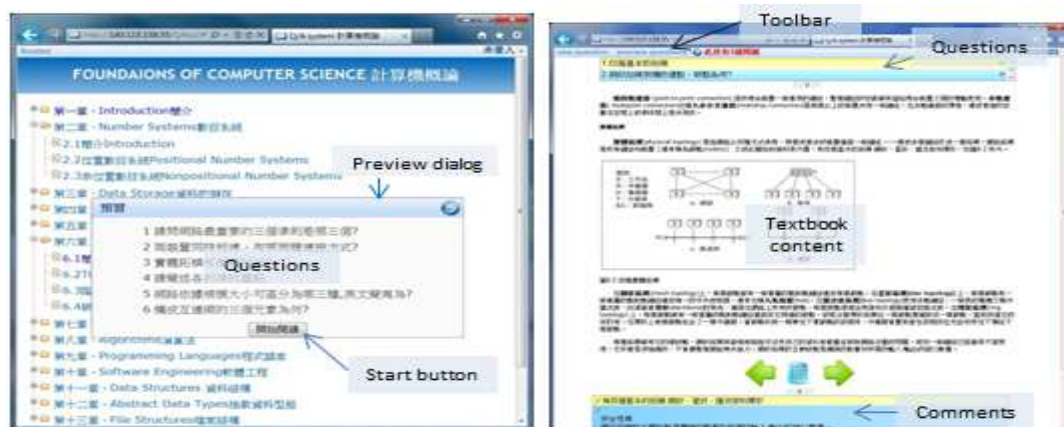


Figure 1. Home Page and Content Page

3. Conclusion

About question-based reading: Through the interviews and observations, we have seen that integration of e-book and questions successfully increased students' motivation of reading, and students gave positive evaluation of this reading approach.

Future "QA-format" e-book design: After this research, we found the e-book system could be improved in the future. First, self-questioning during reading is an important issue. Participated students suggest that adding a more complete design would increase their motivation of asking question. Many studies have mention that asking question by students' own could facilitate more effective instructional procedures [10]. Second, there would be needed a teacher editing interface for general use. Third, some students indicate that they are more familiar with the paper book than e-book.

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