디지털 교과서를 이용한 영어 교수-학습 사례연구

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요 약

최근 첨단기술의 발달과 모바일 인터넷의 사용 증대로 디지털 교과서 개발이 활발해지고 있다. 따라서 본 사례 연구는 2명의 영어 학습자와 교사가 어떻게 디지털 교과서를 통해 학습하고 교수하는지를 관찰과 인터뷰 기법을 통해 탐구했다. 연구 결과 영어 학습자와 교사는 간편하고 다양한 기능과 빠른 인터넷 기반의 디지털 교과서를 통해 교수-학습에 도움을 받은 것으로 나타났다. 그러나 디지털 교과서가 제공하는 많은 양의 정보가 오히려 학습자의 학습을 방해하고, 디지털 교과서를 사용하는데 있어서 교사와 학생 모두 기술적인 어려움을 겪었다고 지적했다. 더 효과적인 디지털 교과서 활용을 위해 영어 교사는 언어적 지식과 더불어 기술적 지식을 학습자에게 전달하고 학습자 주도 학습을 위한 가이드 역할을 수행해야 할 것이다.

키워드 : 디지털교과서, 사용자 경험, 영어 학습, 영어 교수

A Case Study of Teaching and Learning English via E-textbook

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Abstract

Recent technological advancements, along with an increase in mobile Internet access, have spurred on significant developments in the production of e-textbooks. This case study explored the affordances of an iPad e-textbook through teacher and student experiences in English lessons using observation and interviews. The results showed that English learners and teacher benefited from handy and quick web access and the all-in-one features of the e-textbook (dictionary, hyperlinks, and note-taking functions). However, information oversupply by the e-textbook confused students' learning and both students and teacher pointed out technical difficulties in using the e-textbook. In order to implement English pedagogy with technologies such as iPad e-textbooks, teachers should be equipped with the relevant technical skills and content knowledge in order to assist them in becoming autonomous learners in the digital classroom.

Keywords : E-textbook, user's experience, English leaning, English teaching

1. INTRODUCTION

The integration of Information and Communications Technology (ICT) is transforming English education and seems to have the potential to offer an entirely new learning experience[1]. The development of e-textbooks is one of these changes. The term 'e-textbook' generally refers to an electronic form of textbook operating on a tablet personal computer (PC). A tablet PC is a computer larger than a Personal Digital Assistant (PDA) and yet smaller than a notebook PC[2]. Tablet PCs, characterised by their touch-based movement and mobility, give a very different learning experience in terms of text semiotics and hypertextuality, functions largely powered by

Internet access[3]. In addition to text, e-textbooks frequently contain hyperlinks and internal functions such as images and quizzes. Furthermore, the Ministry of Education has announced a plan to gradually replace all printed textbooks with tablet-compatible e-textbooks by 2016[4]. Complying with these changing needs within the industry and education policy, major textbook publishers have become enthusiastic about introducing e-textbooks to the market. With regard to research, as the introduction of e-textbooks to English classes is still in its early days, there are currently very few studies exploring the e-textbook in the context of teaching and learning English. In response to the need for further literature, this case study explored users' experience of e-textbooks in the context of English education from the viewpoints of both teacher and learners using observation and interviews. More specifically, this study focused on the benefits and weaknesses of using the e-textbook in the English lesson.

2. LITERATURE REVIEW

As the use of e-textbooks continues to gradually increase, interest has grown with regard to how e-textbook applications can enhance learning[1]. Numerous experimental studies have been conducted that report various positive effects of the use of e-textbooks. Firstly, the use of e-textbook allows larger lectures to become more interactive[5]. One example is the use of an e-textbook as a presentation tool with real-time natural handwriting in addition to prepared lecture slides[6]. Minnich et al. (2015) claim that e-textbooks allows users to integrate prepared and ad hoc notes and to better preserve their ad hoc notes. He also reports that this feature increases the interactivity between the presentation and the students. Furthermore, Minnich et al. (2015) argues that real-time handwriting encouraged more participatory classroom interaction in engineering and maths courses where drawing and graphs are an integral part of the lecture. Secondly, Ford (2014) reported that the ability of e-textbook users to share information anytime promoted two-way communication between the teacher and students[7]. In Ford's (2014) study, students' notes made on the e-textbook (i.e. lecture notes and writing assignments) were sent to the teacher. The teacher used these notes not only to monitor the students' written work in a convenient way, but also to engage in self-reflection and to give feedback to students. Thirdly, teaching with e-textbooks offers room for teachers to understand more about their students' learning processes. This is possible through the note-taking function. In Larson (2010)'s study[8], two primary school aged students were asked to engage in the self-reading of an e-textbook and to add notes using the annotation function. The notes added by the students allowed the students to document their questions and thoughts without interrupting the flow of the lesson. As a result, teachers could later examine the notes and discover previously unknown sides to the children's personalities, as well as keep track of their thoughts while reading. Although the advantages and potential uses of e-textbooks in education seem promising, these benefits can produce some potentially negative side effects. Sheppard et al.'s (2009) early studies suggested that students preferred printed books to e-textbooks[9]. The reason for their preference was found to be readability issues with the e-textbook. Previously published literature such as Robinson (2011)[10] and Jeong (2012)[11] showed the differences in behaviour when reading on a screen and reading in print, as well as potential issues related to eye fatigue. While readability

continues to be perceived as a barrier, the emergence of new technological devices like the iPad may have the potential to overcome any remaining resistance from students, who will come to 'embrace' reading from a digital screen[12]. Considering the literature review above, this case study investigated the use of an e-textbook developed for the iPad, which offers a reader-friendly digital touch-screen forma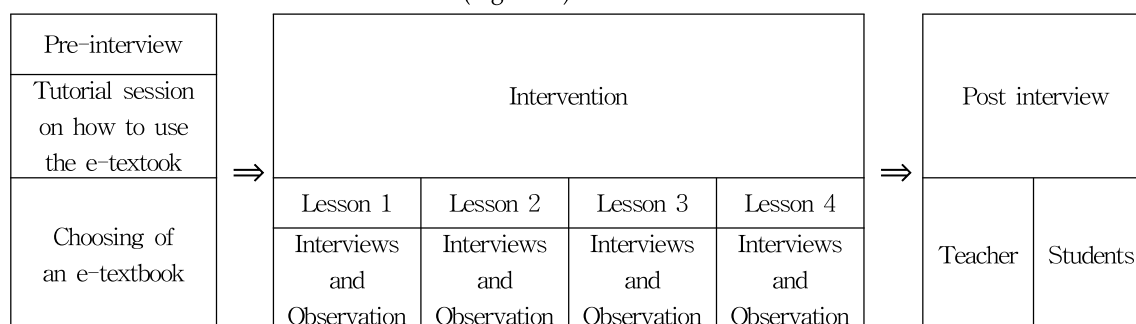t. In particular, this qualitative study concentrated on the benefits and weakness of using the e-textbook in the English lesson through observation and interview methods.

3. METHODOLOGY

3.1 Procedure

(Figure 1) shows the procedure of this study.

(Figure 1) Procedure

Pre-interview	Intervention				Post interview	
Tutorial session on how to use the e-textook						
Choosing of an e-textbook	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Teacher	Students
	Interviews and Observation	Interviews and Observation	Interviews and Observation	Interviews and Observation		

3.2 Participants

3.2.1 Students

Two female college students (both 19 years old) received English lessons once a week for four weeks. Their background information shows that both students had a similar English proficiency level (intermediate; IELTS score of 5.1 and 5.4) and amount of previous English education experience (6 years). In addition, they were both already iPhone users and thus familiar with the basic interface of Apple touch-screen products. Student 1 exposed to iPhone for average 2hours per day and Student 2 exposed to iPhone for average 2.5hours per day. However, neither student had ever used an iPad or any other tablet for academic purposes. Since the two students were going to be using an iPad e-textbook for the first time, they were both introduced to the basic functions of an e-textbook such as using note-taking, highlighting, hyperlinks built-in dictionary and email during a tutorial session prior to the first actual class.

3.2.2 Teacher

A PhD female student who was a teaching assistant in Teaching English to Speakers of Other Language (TESOL) course in an university and a former high school English teacher conducted the English lesson, English Reading 1, for this study. Although she had taught English for 8 years, she had no experience of using an iPad or any other tablet to teach English. However, she had experience of using an iPhone and iPad similar to participated students. And she was familiar with the basic interface of Apple touch-screen products. She was exposed to iPad average 3.25 hours per day. Teacher also took same tutorial session with the students.

3.3 Data collection methods

A case study is characterised by being an in-depth study exploring and interpreting situations through close study of those involved in them, and can therefore be defined as interpretative and subjective[13]. The current study applied a case study, since this type of research emphasises 'detail and contextualisation', thereby allowing the researcher to closely identify interactive processes[14]. In this case study, the interactive processes observed were the interactions and engagements with the e-textbook. This study used an observation method (with the researcher observing the English lessons and using a video recorder to record them) and an interview method. Using these two different data collection methods helped by allowing the cross-referencing of data sets and enhancing the credible and dependable results drawn from the study[15]. For the observation, all four of the lessons in which the students used the e-textbook were observed by the researcher and video-recorded for subsequent analysis. Interviews were the primary method of formal data collection. Before the series of lessons started, a short interview was conducted to gather the participants' background information. After each lesson, the teacher and students were interviewed briefly. These interviews were informal and open-ended to allow the researcher and participants to pursue ideas developed during previous talks and observations. All interviews were recorded and transcribed for coding and analysis. After the final lesson, a post interview was conducted for the purposes of analysis.

3.4 Treatment

Two students participated in four one-hour English lessons, English Reading 1, held once a week over four weeks. The teacher taught the lessons using an e-textbook. A sample timetable in <Table 1> shows the typical flow of each lesson.

<Table 1> A sample of timetable of the lesson

Activity	Details	Time (min)
Review	Students review vocabulary and grammar points from the previous lesson by the word cards provided by the e-textbook.	10
Reading main reading text	Teacher leads the students through a reading using a built-in dictionary. Students take notes using all-in-one tool.	25
Quiz based on the main text	Students answer comprehension and vocabulary quiz provided by the e-textbook.	10
Writing task	Students complete a short writing task using all-in-one tool. Teacher provides feedback.	10
Summary	Teacher summarizes the lesson.	5

3.5 Material

The chosen e-textbook was published by A publisher and was distributed to high school English teachers as a sample book. This e-textbook was available for use on the iPad, a mobile device with a large multi-touch screen, sleek profile, and ability to easily download and purchase a huge variety of educational applications that make it attractive to educators[2]. The format of the e-textbook closely simulated a standard printed English textbook in appearance as presented in (Figure 2). Each chapter consisted of the following subsections: Warm Up, Listen & Speak, Before You Read, Let's Read, After You Read, Language Focus, and Write Right.

It also came equipped with four main digital features. The first feature was the built-in dictionary, which allowed users to look up English-English definitions of words by tapping on the 'define' function. This feature allowed learners of English to quickly look up difficult vocabulary items. The second

feature was highlighting and note-taking. This feature allowed users to highlight text using different colours and make notes anywhere in the e-textbook. The third feature was hyperlinks, which allowed users to explore further information through diverse online multimedia resources. The final feature was e-mail, which allowed users to send and receive e-mail among the students and the teacher through online.

(Figure 2) Sample of *Let's Read* section

3.6 Analysis

The collected data was coded in order to identify principal themes and then analyzed using content analysis. Content analysis is "any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings"[16]. Content analysis was chosen because the current study aimed to address the research question by identify patterns among large amounts of qualitative data. Analysis of the collected data began with an inductive approach before progressing to deductive analysis as themes became more apparent, a progression designed to support the authenticity of the findings. During the inductive stage, several central themes emerged from the data. By the third round of analysis on the first interviews, eight categories that appeared significant were coded from the data: 'hyperlinks', 'highlighting',

'note-taking', 'dictionary', 'technical difficulties', 'teacher role' and 'student role'. After the third interviews had been analyzed, two new categories were added: 'easy editing' and 'oversupply of material'. The final data was analyzed using these seven selected themes. Due to space limitations, the discussion will be restricted to the two strongest themes to have emerged from the data.
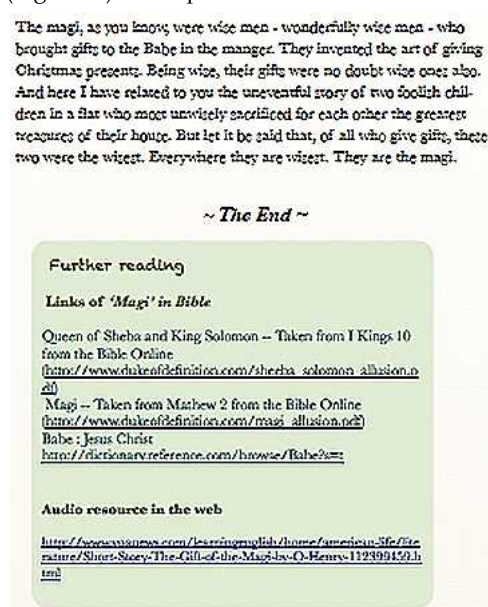
4. RESULT AND DISCUSSION

4.1 Benefits of the e-textbook
4.1.1 Supply of diverse web-based resources

The hyperlinks allowed the learners in this case study to explore further information through diverse online multimedia resources as presented in (Figure 3).

(Figure 3) Example of web-based resources

During the lesson, the teacher also used the hyperlinks, particularly for the purpose of presenting new vocabulary using web-based multi media, video clip.

"The visual hyperlinks were especially effective when explaining cultural vocabulary while teaching the reading passage. It's very convenient to look those up ... When the concept or the object does not exist in students' native language and culture, I think showing them a picture or video can help their understanding. Sometimes pictures or video-clips are more effective than word-definitions when it comes to vocabulary acquisition." (Teacher interview)

The students gave positive feedback on using hyperlinks in vocabulary learning. Student 1 mentioned that she particularly liked the video links from vocabulary glossary and said that this method helped her to remember new words.

I especially like the video links. I'll never forget the meaning of the word 'whirl' after seeing the Youtube video link of a boy spinning around. (Student 1 interview)
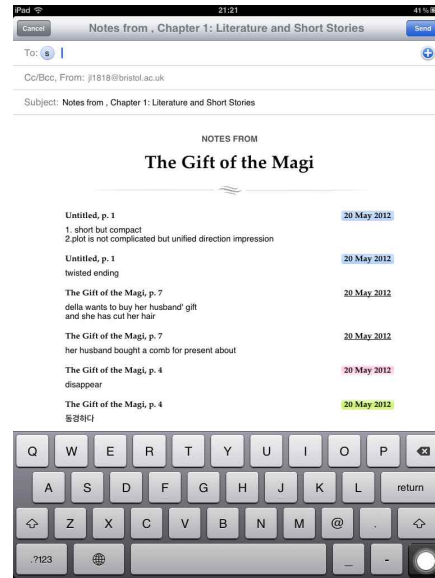
4.1.2 All-in-one tool

The students and the teacher mentioned that the e-textbook was handy because of its all-in-one features (i.e. note-taking, highlighting and e-mail) as presented in (Figure 4).

The students expressed particular approval of the e-textbook's capability to permanently store notes that could then be shared easily with the teacher and other student via email. Student 2 stated:

"The e-textbook makes it easy to keep a record of my work compared to paper ... and there's no need to carry a pencil, eraser, or highlighters ... it's all here inside." (Student 2 interview)

(Figure 4) Example of sharing study notes via email using all-in-one features

From the interview data, it can be inferred that Student 2 considered the iPad to be a handy and efficient tool because it allowed her to store all the learning resources she needed in one place. This data supports the claims that e-textbooks integrate multi digital features such as note-taking, dictionary, and web-access functions, which are not available in printed textbooks[18].

4.1.3 Customized feedback

Printed textbooks cannot be edited after they have been published[7]. However, since e-textbooks can be updated anytime, teachers could add content in response to student's particular question or learning needs in the current study as presented in (Figure 5).

The teacher's feedback on my writing assignment in the e-textbook encouraged me to correct the wrong answers on my own. That's because teacher's feedback provided helpful links that explained why I got the wrong answer and how to correct it. (Student 1 interview)

(Figure 5) Example of teacher's customized feedback on students' answer on the quiz provided by the e-textbook

This customized hyperlink feedback from the teacher helped students to find answers by themselves, therefore increasing their level of 'learner autonomy', which is defined as "the ability to take charge of one's learning"[19]. In English as a Foreign Language (EFL) context such as Korea, where class sizes tend to be large, and where mixed-proficiency level classes are common[20], teachers could edit e-textbooks anytime to provide more customized feedback for students to learn independently.

4.2 Weaknesses of the e-textbook

4.2.1 Needs of teacher mediation on information oversupply

As shown in Scene 2 below, the teacher suggested that students look up an unknown word. The e-textbook allows users to search for the meaning of a word through a handy built-in dictionary function. This helped the students quickly search for definitions, but in this particular case, the students couldn't find the right definition.

T: … What is 'sacrifice'?
S: [silence]
T: How about trying to look it up in the dictionary, using the 'define function'?

S2: [reading] 'The act of slaughtering an animal or person or ..'
T: I think you have to look up the verb here, not the noun.
S1: Ah… [reading] 'An offer or act of killing - a religious sacrifice…'
S2: [reading] 'Give up something important or valued…'
T: Right! In this context, it is used both as a verb and a noun, but here it's used as a verb with the second meaning - 'to give up'.

Although the e-textbook provided helpful information for students' learning, the students had difficult time to choose right information among diverse information provided by the e-textbook. Too much information supplied by the e-textbook can make students even more confused [12].

Therefore, the teacher had to provide further guidance as to which usage of the word the students needed as presented in Scene2. This interaction between the teacher and the students aligned with Kupier et al.(2005)'s finding that the key role of the teacher in digital pedagogy is to guide students in transferring a bulk of information into meaningful knowledge[21].

4.2.2 Technical Difficulties

Since the students in this study were using an e-textbook to study English for the first time, they had some difficulties utilizing some features of the e-textbook. Although this study provided a tutoring session on how to use the e-textook, the students still had a range of difficulties at each stage of use and required technological assistance during the lesson, as shown in <Table 2>.

<Table 2> Students' requests for technological assistance made at different stages of the lesson

Stage	Pre view	Reading	Writing	Review
requests for technological assistance	finding the glossary	how to return to the e-textbook from the hyperlinked websites	how to copy	how to go back to previous vocabulary cards
number of inquiry	2	4	3	2
	how to return to the e-textbook from web links	how to control the volume	how to send an email	
number of inquiry	4	2	3	
	finding the search option		how to save the document	
	2		4	
total number of inquiry	8	6	10	2

During the four lessons, the students asked for technological assistances 26 times. For example, when the students wanted to watch the hyperlinked video clip for vocabulary learning, they didn't know how to adjust the volume, which was too low. In the first lesson, the students requested technological assistance from the teacher with regard to basic iPad functionality. Such technical difficulties in using e-textbooks could be a potential problem in larger groups in the actual learning environment. The students' frequent requests for technical assistance from the teacher during the lessons seemed to imply that the tutorial session had been insufficient in preparing them to use the e-textbook confidently. However, Student 2's opinion on the tutorial in the post interview ran counter to this inference.

I think the tutorial was enough, but there just wasn't enough time for me to practice and get used to the e-textbook. I think students need to develop a continuous habit of using it. They have to get used to it by using it – get used to the device and functionality. Practice makes perfect. (Student 2 interview)

The teacher had a similar opinion about the need for practice.

Aside from the tutorial, familiarity with a new device naturally increases over time. ···I got more confident at using the iPad e-textbook after I finished my first lesson. (Teacher interview)

These comments made by the teacher and Student 2 suggest that experience and habit formation are very important, underpinning the idea that giving students and teachers more time to become familiar with the device, and allowing them to try it out on their own, is more effective than attempting to preparing them in a single tutorial session.

To sum up, the results of the current study suggested that the participating students and teacher benefited from the digital textbook's following features: a) diverse web-based resources via hyperlinks, b) all-in-one features including highlighting, notetaking, and e-mailing, and c) editing features that facilitate customized feedback. Despite the many advantages of the e-textbook, which encouraged the learners to study independently by providing diverse web-based resources and handy built-in tools, some weaknesses were also observed. Students were distracted by the oversupply of information provided by the e-textbook and they needed the teacher's guidance to select the relevant information. Furthermore, the teacher had to continuously provide technical assistance for the students, who had some difficulties with the functions of the e-textbook and the iPad interface.

The findings of the current study have several implications for English teachers with regard to using e-textbooks. Firstly, there are implications with regard to the responsibilities

of teachers within the classroom. Using an e-textbook that provides links to online resources in the lesson increases the responsibility for teachers in inserting links to new material or selecting appropriate web-based materials for student feedback. In addition, teachers should take responsibility for teaching students how to approach online information with a critical eye; for example, how to recognize bias, how to balance information with other sources, and how information fits into a larger context. Secondly, there are implications for the role of teachers within digital pedagogy. In order to facilitate learning, teachers should give students feedback that does not just tell them the answer but rather guides the process of converting information into meaningful knowledge' using the advantageous features of the e-textbook[22]. Moreover, it is important for teachers to equip their learners not only with English knowledge, but also with the technical skills needed to use an e-textbook in order to assist them in becoming autonomous learners in the digital classroom. However, because of limitations of this study, including the small sample size, short duration of treatment, this result is tentative rather than conclusive. Research on a large number of students in an actual English class context might result in different outcome. However, this case study is exploratory in nature, attempting to contribute an initial step to using e-textbook in the context of EFL learners in Korea. More studies are required to systematically examine the e-textbook in English digital pedagogy in a bigger scale.

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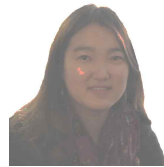
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