English Language & Literature Teaching, Vol. 20, No. 1 Spring 2014

The Effects of the Features of a Digital English Story for EFL Elementary School Learners

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Im, Kyung-Bin. (2014). The effects of the features of a digital English story for EFL elementary school learners. *English Language & Literature teaching*, *20*(1), 69-92.

This study investigated various features of a digital English story for EFL elementary school children concerning supportive effects of digital English stories such as pictures, animations, narration and interactive features. If digital English stories have more effective features for learning, it could help the learners more successfully. The major purpose of this study is to analyse the effects of various features of digital English stories to design more supportive digital English stories for children's language learning in an EFL situation. In this study, a digital English story was selected and 52 4th year elementary school students were participated for the experiment. The experiment was designed to find out the effects of various features of the digital English story on learning. The children's performance was evaluated and their opinions were collected through test, observation, and survey. Although it was very hard to decide which feature is connected to which learning result, it seems evident that the overall effect of the digital English story on learning English was statistically meaningful in relation to the results of the test and the survey.

[Digital English stories/young learners/supportive features of digital English stories]

I. INTRODUCTION

English stories have been considered as a very useful English teaching material in an EFL situation especially for young learners. Many research results indicate that English stories used for English teaching were successful in an EFL context such as Korea (Jang, 2008; Jeon, 2004; Kim, 2003; Kim, 2005; Kim, 2008; Park, 2006). Many researchers also stressed the benefits of stories for language learning in relation to learner motivation and authentic language experience (Loukia, 2006; Ghosn, 2002; Garvie, 1990). One of the

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most interesting ways of using English stories for English teaching purposes may be using digital English stories. Digital English stories provide a greater number of features than ordinary story books. They provide narration along with the text and pictures. Some of them even have animation features and sound effects. These features can help English learners in many occasions. For instance, learners can listen to the narration easily as they are synchronised with the texts. Some digital English stories change the color of the texts to match the narration with the texts. Animation features can also help learners' understanding of the story since they can show the meaning of the story by demonstrating the action. There are many digital English stories available on-line at http://kr.kids.yahoo.com/ and other websites as well. Digital English stories can be called with several different names such as CD-ROM title stories, talking books, living books and interactive books (De Jong and Bus, 2003). De Jong and Bus (2003) tried to categorise them depending on the features such as interactivity, and dramatization. In this study, however, the term "digital English stories" will be used to refer to all upper mentioned names for convenience.

Needless to say, some of the digital English stories are interesting and supportive but some others are not. If the digital English stories should be interesting, not only the story itself but also the design features of the story should be interesting. This study investigates supportiveness of a digital English story which may be one of the most important design features for learning. If a digital English story has more developed supportive functions, learners may learn better and easier from it than less supportive ones.

The supportiveness of a digital English story can be developed according to the extent of interactive features. In many digital English stories, this interactive feature seems to be minimal. It is not very common to find highly interactive digital English stories (De Jong and Bus, 2003). Many of them just provide texts, pictures and narration while technology can create wide varieties of interactive features by means of hot spots which trigger a certain action in the picture. These hot spots enable learners to interact with the characters and the landscape in a story to hear sounds and speech, and see animation and useful information for learning English (Anderson, 1992). Research in this interactive feature of software can help to develop a more interactive and interesting English learning environment using trans-media storytelling technique which expends the scope of storytelling into multiple media type such as TV, movies and video games for edutainment in the future (Long, 2007). This study is different from other pieces of research which examine the overall effects of digital English stories on English learning. This study focuses on various supportive features of a digital English story such as pictures, animations, and interactive features to consider effective ways of designing it.

The major purpose of this study is to analyse the effects of various supportive features of digital English stories such as pictures, animations, interactive features, and narration to

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find out the effects of those supportive features to make more supportive multimedia English stories for children's language learning in an EFL situation.

This study first looks at theoretical backgrounds about the ways of supporting learners with technologies in relation to language learning. Secondly, it summarises previous research results in relation to the effects of digital English stories. Thirdly, the methods of data collection and analysis of the experiment which was designed to identify the supportive features of digital English stories are presented. Fourthly, it reports the findings of the study from the data analysis which is concerned with demand & support analysis, input analysis, and test result analysis. Finally, the implications drawn from the data to make more supportive digital English stories for English learning in an EFL situation are provided.

II. LITERATURE REVIEW

1. Interaction

Interaction can be one of the most important concepts for successful learning in the social constructivists' view (Wertsch, 1985). In their view, knowledge is constructed by learners as they attempt to understand their experience while interacting with other people (Driscoll, 2000). In addition, the value of interaction in a learning situation becomes more and more important along with the development of ICT (information and communication technology). For instance, in the field of distance learning, the quality of interaction is the most crucial factor for successful learning (Su, Bonk, Magjuka, Liu & Lee, 2005).

The concept of interaction is considered to be hard to define. Rose (1999) claimed that the concept of interaction is a fragmented, inconstant, and rather cluttered notion especially in the area of instructional technology (Rose, 1999). However, according to Wagner (1994) interactions can be defined as reciprocal events that need at least two objects and two actions which occur when these objects and events bilaterally influence one another. Interactivity is another important concept which is very similar to that of interaction but more feature-oriented and stresses the aspects of the delivery system or the extent of interaction that certain communication channels provide (Su et al., 2005). Wagner (1997) said that interactivity emerged from descriptions of technological capability for establishing connections from point to point (or from point to multiple points) in real time.

Moore (1989) suggests three kinds of interaction: (1) learner-instructor, (2) leaner-learner, and (3) learner-content interaction. The first type of interaction (learner-instructor) establishes an environment that encourages learners to understand the content better (Su et al., 2005). It is considered as essential by many educators and highly required by many

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learners (Moore, 1989). Learner-learner interaction takes place "between one learner and other learners, alone or in group settings, with or without the real-time presence of an instructor" (Moore, 1989:4). Many studies show that this type of interaction is also a respected experience and learning sources (Su et al, 2005). The third type of interaction is defined as the process of intellectually interacting with content that results in modifications in the learner's understanding, the learner's perception, or the cognitive constructions of the learner's mind (Moore, 1989). There are more types of interaction such as vicarious interaction, and learner-self interaction, however the most relevant type of interaction for this study is learner-content interaction. Thus other types of interactions will not be mentioned in detail.

The early computer based learning material adopted highly structured design approach as follows; (1) gaining of the learners' attention, (2) presentation of a factor or concept, (3) showing an example or non-example, (4) evaluating students' learning of the concept by conducting an assessment (Hedberg, 2004). Though this kind of learning/teaching computer material can be very informative, this might not create a lot of interactional chances. Hedberg (2004) said that this design approach meant that the order of examples and learning activities was mechanistic; often it focused on atomistic rudiments of the content rather than presenting unifying models of the total. However, more recent types of multimedia computer learning material often present ideas in parallel rather than sequential structures (Hedberg, 2004). This change means that designers can have more room to create more chances of interaction between learner and computer.

The interaction between learner and a computer can be categorised as learner-content interaction. Usually, computers provide information which learners need to study. However, if the computers can provide appropriate support which helps learners' learning as well as contents, the learner-content interaction can be closer to learner-instructor interaction. Or if computers can play a role like a learner's friend, the interaction can be closer to learner-learner interaction. Like this, the interaction between learners and computer can be changed into slightly different model of interaction depending on the contents and design methods.

2. Supporting Learners with Assistive Technologies

Narration is the most common feature of many digital English stories. These are read with emotion and often by the characters in the story to enhance vividness and give voice to each individual character (Grimshaw et al., 2007). Narrations are helpful in that they can help learners accommodate for decoding of fluency problems, allowing them to read the story for comprehension purposes (Grimshaw et al., 2007). In addition, in an EFL situation, narrations help learners to listen to model pronunciation of English words and sentences.

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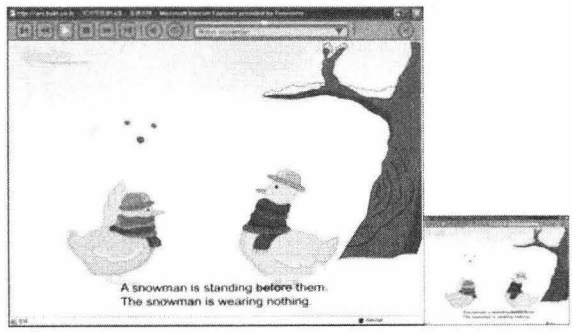
Highlighting features are also useful to help children discover the connection between text and oral reading (Stoeckle, 2012). For learners in an EFL situation, this feature is crucial as they can see which word is being narrated and therefore learn the sound of the English word.

Animations and sound effects are some other distinctive features of digital English stories that make them different from printed story books. These may be one of the most interesting ways of supporting learners to understand meaning of English words and stories. The purpose of these effects is to draw learners' attention to the most important aspects of the text, helping in comprehension (Grimshaw et al., 2007). By using animations, English words can be explained as an action, shape and sound. Similarly, hotspots (or hyperlinks), which are areas on the screen which children can click for further explanation or the definition of an English word (Korat & Balu, 2010). Hotspots can provide interactive features between learners and computer providing additional information to understand the text.

The frequency of the interactive features created by hotspots can greatly influence on the number of chances for learning. For instance, in the following example story in figure 1 (left) 'Warm snowman', there is not a single chance to interact with the software or the ducks or the snowman as the story is narrated automatically. Thus, if a learner finds difficult words in the story, there is no chance to get support from the computer and learn something from it. However, if this story has hotspots, learners can learn from the additional information provided by the animation, sound effects or narration.

FIGURE 1

Example Pictures from 'Warm Snowman (http://www.ani.buki.co.kr)'



Frequent interactional chances also might help learners to pay attention to the reading task, since the program awaits learners' answers. This kind of process could be seen as a similar contribution to that of teachers or parents in learning situations. Skilful teachers and parents could direct the child's attention to the goal of the task. This process is an important

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role of scaffolding in learning. Mercer summarised Bruner's idea of scaffolding as: '(scaffolding) refers to the steps taken to reduce the degree of freedom in carrying out some task so that the child can concentrate on the difficult skill she is in the process of acquiring.' (Mercer, 1995:73).

In addition, as the frequent interaction could make the children pay attention to the next tasks after they finish one task, this may also play a role of Bruner's concept of 'Ratchet' (Bruner, 1978:254). He writes that 'once the child has made a step forward, (his mother) will not let him slide back. She assures that he go on with the next construction to develop a next platform for his next launch.' (Bruner, 1978:254).

Furthermore, frequent participation may make children consider the program more interesting in comparison to a program which has no or infrequent participational chances. They might think of this participation as a kind of role playing game with their friends, toys or dolls as they need to respond. This 'turn taking' between the characters and the learners in the interaction is similar to that of human interaction. When the characters in a story ask questions, the users need to answer just as in ordinary human-human interaction. In this way the interaction between the characters and users can be continued and engaged. This basic structure seems to be very important for the formation of interaction. Considered from the sociocultural language learning perspective, frequent chances of interaction may increase the opportunities for successful learning. Cooper (2003) says that through frequent interaction learners could become more engaged with the software which could result in better learning results.

Many digital English stories which I examined appear to fail to provide sufficient support for understanding of meaning. For instance, as I mentioned the above example figure 1 (left) the characters in the story do not provide support for learning. If a learner does not know the meaning of the words such as 'snowman', 'standing', 'before' and 'wearing' in the above example, he/she cannot understand what the sentence means at all. They might feel like looking at the small figure 1 (right) above. In the picture, as the text is too tiny, and it is unclear why the two ducks are standing in front of the snowman and what they are talking about pointing at him. Even though the children can see the picture, they may not understand fully the meaning of the story without understanding of those words, and they might want to ask someone what the English story means. There is no opportunity for interaction between learners and the characters in the software. The learners may find it very difficult to understand the story and easily lose interest. This is not an extreme case, but one of a number of examples of this kind.

However, well designed HCI may help learners to understand the story better in the same way as thoughtfully conceived human interaction without computers. There might be several ways of supporting learners through HCI. For instance, a digital dictionary might help learners to find difficult words quickly. However, this kind of support will be less

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sophisticated than that of human interaction. One of the most important differences between the two may be the chance for learners' thinking. In human interaction, the teacher (or parents) provides learners with chances to think and solve the problem by themselves. They help learners to link their existing knowledge with new knowledge by themselves by explaining relevant concepts rather than just providing answers.

Supporting learners with these technologies also can help teachers or parents. Without these supportive features, children need to ask their teachers or parents whenever they encounter unknown words. However, if a program provides this kind of support, learners could understand many of the difficult words in the story by clicking on the words they are not sure of, instead of asking others.

A further consequence is that learners may have considerably different feelings in comparison to their ordinary lessons. In their ordinary learning situation, the relation between a learner and a teacher is unequal, and from this unequal relation, a more capable participant can contribute to the development of less capable participant. However, in this kind of HCI, the less capable participant is in a very different situation. Although the computer provides opportunities for learning, the learner has more power to control the interaction. In HCI, the style of the interaction is more like a peer-peer interaction style, since the less capable participant could have similar or even larger amount of power to control the interaction. However, the information in this interaction can be more reliable than that of peer-peer interaction, since the computer can provide more accurate content knowledge than the learners. From the sociocultural perspective, the learner's independent thinking process is important for the completion of learning (Allahyar & Nazari, 2012). This independent thinking ability enables learners to achieve self-regulated learning, which is regarded as a very important factor for effective learning (Allahyar & Nazari, 2012).

3. Previous Study Analysis

There have been many researchers who studied about the influence of English stories on English learning in EFL context in the literature (Im, 2010). Though this study is related to this topic, the precise focus is more on the issue of design features of digital English stories. The number of researchers who studied this issue appears to be very low. However, the most relevant field of research will be those which studied the influence of digital English stories on English learning and teaching. This study is more focused on the deeper aspects of digital English stories in relation to their supportive or interactive features. The following research results show the general influence of digital English stories for English learning.

Lee (2007) experimented on the effects of English storybook making activities with 24 5th year elementary school children for 14 months. The children studied with Internet

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English stories on "www.kizclub.com" site and then were asked to make English story books using the English words and sentences they learned from the stories. Lee (2007) concluded that the children's reading ability had improved after they did the bookmaking activity. Lee also reports that the activity also helped to reinforce the children's positive attitudes towards English learning.

Lee (2009) investigated the effect of the reading of sight words using English stories on the Internet with 64 4th year elementary school children. The study includes 16 weeks of teaching of sight words in 4 English stories on "kr.kids.yahoo.com" site. The stories used for the study were 'It is raining today', 'I see', 'Curious cat', and 'What time is it?' Lee (2009) reports that the teaching of sight words using English stories helped to improve the children's reading ability. She also suggests that the student's interest on learning English, self-confidence and participation towards reading English were increased as a result of the activity.

Hong and Huh (2011) also studied about the way of elementary English reading instruction using the Internet-based fairy tales. Their study included 14 (6 of 3rd year and 8 of 4th year) students and lasted for 8 weeks (two lessons per week). They used four English stories from two websites including "www.littlefox.co.kr" and "www.Kebikids.com". They introduced the stories in every lesson along with various activities such as word-map, bingo, word search, grab bag, memory game, speed reading practice, and speed reading game. They reported that the Internet-based English story reading instruction helped improving the students' reading ability, positively influenced on the students' affective domain such as learning anxiety and confidence, and increased students' interests, self-confidence, and willingness to participation.

Though these study results show the positive effects of digital English story in several aspects such as vocabulary learning, reading skills and affective domain, they did not mention about the detail features of the Internet English stories and effects of them. The following study seems to be more closely related to this study.

Vilaseca, Basil and Reyes (2013) investigated the effectiveness of specific design features of multimedia program called Divertext which is designed to help young children's literacy development including reading, and writing. They compared two groups of children and the results of their study indicated significant difference between the two groups. They also asserted that their study results agree with research on early literacy that has shown that multimedia programs such as digital stories can produce positive reading and writing learning effects in very young children. Though their multimedia program is not exactly the same as digital stories, it has similar supportive features such as animated cartoons.

Lewin (2000) investigated the effectiveness of specific design features of digital English stories (talking books) such as sub-syllabic word pronunciations, hints to encourage independent word identification and activities to reinforce specific reading skills. She

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compared two versions of software, one with minimal functionality ('Basic') and the other with all design features ('Enhanced'). The software was used daily for a period of four weeks by 16 children aged 5 to 6 years. She asked both groups to read the text independently, selecting word pronunciations only as necessary, and then to use the read aloud feature to self-check reading accuracy. Then the enhanced software group was instructed to read the complete book first, for less interruptions and greater comprehension, and then to read again attempting one activity on each. The Basic software group was assigned to read a book repeatedly and then read a previously unseen book.

She reported that talking books can positively affect both cognitive and affective learning outcomes. After one month, the Enhanced software users made an average gain of 6 months (reading age) whilst the Basic software users made an average gain of 4 months on the Burt Reading Test. It appears that both groups achieved greater gains than probable progress in one month. She concluded that children beginning to recognise words can benefit from word pronunciation feature. Children with limited sight vocabulary can benefit from exposure to reinforcement activities and children with more advanced reading skills can benefit from hints to support independent word identification. This study was conducted in L1 context not EFL context. However, the results indicate how specific design features can influence on learning. Though, the target language may be different, the results of this study appear to be very important for this study.

Korat and Shamir (2008) also report the positive influence of supportive features of interactive digital story books. They experimented with 149 five- to six- year kindergartners. They separated the children into four groups to compare the effects of different types of reading activity: 'Read story only', 'Read with dictionary' or 'Read and play' and regular program of the kindergarten. The software was designed to teach Hebrew to Israeli children. The main features of each mode of reading activity were as follows.

* Read story only: oral reading of the printed text by the actor together with automatic dynamic visuals that dramatize story scenes as well as extra music and film effects.
* Read with dictionary: the same oral reading of the text plus explanations for difficult words that appear automatically after the narrator has completed reading the whole page.
* Read and play: aimed at enhancing children's story understanding and their phonological awareness by inviting the children to activate hotspots appearing on the screen.

Their results show that 'Read with dictionary' and 'Read and Play' were the most efficient modes in the software used in their research. Children in the 'Read with dictionary' mode group showed the greatest improvement in their knowledge of word meaning compared with all other groups. In contrast, children in the 'Read story only' mode group showed no improvement in their emergent literacy skills. This result also

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displays the importance of supportive features of digital English stories on children's literacy skills.

III. METHODOLOGY

1. Data Collection Method

For this study, an experiment was constructed to find out the effects of various features of digital English stories on learning. In this section a detailed description about the experiment will be provided including the subjects, the digital English storybook and the procedure of data collection.

It was difficult to find an appropriate digital English story for the experiment due to the limited number of available stories. The title of the story selected for this study was "Let's Play Hide and Seek (https://elib.djsecc.or.kr)". The author was Korean and it was designed for Korean children. This story may be unfamiliar to some of non-Koreans, as it has a game called 'scissors, rock and paper'. The purpose of this game is to select one player who has to find the others like tossing a coin. However, this game is very familiar to most Korean children. This story has nine pages, which requires clicking the mouse nine times to turn over, thirty-four sentences and 275 words. Each page includes several sentences, which automatically appear and disappear.

1) Choosing the digital English story

I examined several web sites, which provide computer-based English stories made with Macro media Flash. Each web site provides various levels of stories with different kinds of support. For example, "Yes24" web site provides English stories with text, picture and narration. On the other hand, some websites provide English stories with text, picture, narration, animation and translation in Korean such as Littlefox. The following features of each website are summary version of my previous study result (Im, 2009). I found these websites through Google search and the reason of selecting these web sites for examining was that these web sites provide an ample number of digital English stories and therefore there was high expectation of finding appropriate digital English stories for this study. In addition, they were located relatively high in the search result and provide free digital English stories which indicate more frequent public access than charged web sites.

(1) Yes24 (http://www.yes24.com)

This site provides 109 English stories for free. There are stories from all over the world

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such as 'Goldilocks and the Three Bears', 'Hensel and Gretel' and 'Alice's Adventures in Wonderland'. These stories are supported by picture, narration and English subtitle.

(2) Dongwhanara (www.donghwanara.com)

This site provides twelve stories, of which most of them are long. The stories provide simple animation and most of the stories are famous such as Aesop's fable.

(3) Little fox (www.littlefox.co.kr)

This site provides classified stories in three levels. The stories are supported by pictures, narration, and animation. There are more than 305 English stories such as 'The Three Brother Goats' and 'The Bravest Dog'. The stories in this site can be seen in two ways; one is a whole view, where the pages turn over automatically, the other is a page-by-page view, and which needs a mouse click to turn over. Each story has its own Korean-English speaking dictionary, which provides the Korean word meaning and the sound of the word in the story. The stories in level 1 seems to appropriate for the child, however, strictly speaking, they are kinds of information text rather than a story.

(4) English fork (www.englishfork.com)

This site provides ten Aesop's fables, which may be familiar to the child. The stories are supported by pictures, simple animations, narration and a translation.

(5) BBC Tweenies (www.bbc.co.uk/education/tweenies/storytime/stories/)

This site provides two stories which are 'The princess & pea' and 'The three little pigs'. The stories are supported by pictures, animations and narrations. They also provide interactional events, which ask the reader to click something in the picture.

For this study, the stories, which provide as many kinds of support as possible, are better than those that have no support. Therefore this feature was the main reason of selection of the story. In addition, the level of English words, the length of each English sentence and the story were also considered for selection. However, it was difficult to choose, since there was no one story, which provides all the kinds of support as the above summary shows. However, interaction might be the most interesting support for children, since it gives them opportunities to take part in more actively. Moreover, it has a similar feature as the social interaction. Though this interaction is non-verbal, it provides turn taking chances similar to the social interaction. Among the above web sites, only three of them have such an interactive feature. Among these stories, the story which has the most frequent interactional chances was selected. This story can be found at https://elib.djsecc.or.kr/Default.asp. One of the most interesting features of this story is that it asks learners to click the right hiding place for each animal. The following picture is the sample picture of the story.

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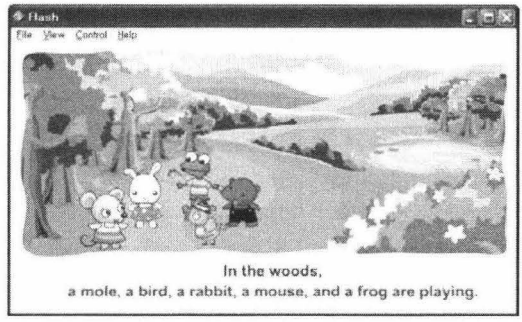
FIGURE 2

Example Picture of Digital English Story



2) The participants

The experiment was conducted with 52 4th year elementary school children in Daejeon, Korea. I randomly selected several candidate elementary schools and contacted each school for access and making arrangement to visit. Some of the schools were not convenient to visit due to various reasons such as exams and school events. So those schools were eliminated and finally one school was selected. There were 30 girls and 22 boys in the group. According to their homeroom teachers, their average social status was in middle class and their average English level was in the middle as well.

3) The tests

From the text of "Let's play Hide and Seek", 23 test items were selected to compare the difference between before and after the reading. The test consists of seven one-word items and sixteen short-sentence items. The items mainly concerned with meaning words such as the animal's names, verbs and short talks, which are related to the pictures and animations as in the table 4 below.

The pre-test includes reading, and words meaning. The test was performed with a separate sheet. In the reading test, the students needed to write down the sound of the English words in Korean. Right after the reading test, a meaning test was followed with another sheet of paper. For the meaning test, I read the test items for the children and they were asked to write the meanings of them in Korean. The pre-test took about 30 minutes to finish.

One week after the pre-test, the children had the reading session. During the one week term, the children had two English lessons and there was no chance to learn test items. A one week interval was intentionally inserted to minimize the effects of possible learning

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effect of the pre-test. Right after the reading session a post-test was implemented in the same way as the pre-test with the same test items. However, this time a survey was added after the test. The post-test took a similar length of time.

4) The observation

The observation was intended to find out what kinds of support the computer can give to the children and how the computer supports the children. Even though I examined many computer-based stories, I only can select an alternative one rather than a perfect one due to the difficulty of the story and the different kinds of support. As this study suggested above, different stories provide different kinds of support. For example, some stories provide translation, whereas others provide detailed animation. This story does not provide translation, however, it gives narration, animation, and some kinds of interaction.

The participants sat in front of a computer and the computers presented the story. The children needed to click to turn over the page from time to time. As the purpose of this study is to examine the effects of the support provided by the digital English story, the children needed to figure out the meaning of English words which they do not know by themselves by using the support. The children watched the pictures, animations and texts, listened to the narration, and clicked the mouse button from time to time. This reading session lasted approximately 40 minutes. As the children and the computer did not talk to each other, the main purpose of the recording was to observe the children's physical, facial and exclamatory reactions.

5) The survey

The observation data of the reading activity did not provide enough information to evaluate the effect of the computer's support fully. The children did not say much about the story, when they were watching it. Thus, I surveyed the children in order to collect the information about the effect of the digital English story's support. This survey was carried out right after the post-test.

I asked about the computer's support while they were reading the story. The questions were mainly concerned with the pictures, animations, narration and other features of the story, which were provided by the computer. It consists of 8 questions and took 15 minutes for them to finish.

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2. Data Analysis

1) Demands and support of the reading task

I analysed the demands and the support of the reading task to investigate the effects of various features of the digital English story. The reading task's language support mainly consists of the support of functions of the software and the structure of the story. After analysing the language support, I connected it to the test result. For example, the pictures, animations and interactions can be considered as the computer's support, which seem to give clues to help understand the meaning of the story like the support from people such as teachers' hints or explanation. In the following table 1 no. 5, the interaction, which the computer provides, might encourage the children to focus on the meaning of the story and it might also help them to understand the meaning of the story. In addition, they can learn how to read the English words in the story from the narration. The structure of the computer story itself gives distinctive support. In the table 1 no. 6, the story helps learners to understand the meaning of "under the earth" by providing animation which shows the mole entering its house under the earth. In the table 1 no. 7, the story provides support by repeating similar events. This repetitive structure which is very common in many children's storybooks might help the child to figure out the meaning of the story or English sentences more easily. The underlined texts with a waved line indicate that they are supported by the software and those with a normal line means that they are supported by the story as in the following table.

TABLE 1
Example Analysis Result

No	Text	Supported by the		Effect
		Software	story	
5	A mole says, "I'll hide in my house. My house is under the earth. So the mouse can't find me."	Animation: The mole says alone. Interaction: The child needs to click a place for the mole to hide. Animation: Arrows indicate four hiding places in turn again and again.		M M
6	A mole goes to his house under the earth.	Animation: The mole goes into the hole under the earth. <Sound effect>		M
7	A bird says, "I'll hide in my house. My house is in the tree. So the mouse can't find me."	Animation/Interaction <The support is same as mole's case except for the different hiding place for the bird. >	Repetitive event	M M M

*Effect; R: Reading, M: meaning

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2) Input analysis

The relationship between what the learner receives as input and what he/she eventually learns is essential both to theories of second and foreign-language learning and to proposals for language-teaching syllabuses and methods (Richards, 1985). Therefore, the input may be the actual opportunities of learning language. Through the experiment, the children listened to the test items several times, depending on the test item. The children heard the test items at least twice since they repeated the story at least two times. However, some test items appear in the story more than once and they listened to those words more times than others.

IV. RESULTS AND DISCUSSION

1. Findings of the Analysis

1) The Comparison of demand and support

To understand the "Let's play hide and seek" story, understanding the concepts of "hide and seek", "scissors, rock, and paper", and different places where the animals are can be the cognitive demand. The children's previous experience of "hide and seek" and "rock, scissors and paper" can also support them. In addition, most of the animals are familiar to them except the mole, and thus this can help their understanding. In relation to the language demand, the children need to understand the new words and the discourse in the story. The computer provides different kinds of support such as animations and pictures. Instead of pointing at the sentence, the computer changes the colour of the text when it is narrated. This might help the children to notice the sentence which is narrated. In terms of interactional demand, the computer asks the children to click the right hiding place for each animal. The children need to click the correct hiding place for each animal by using their general knowledge. The computer indicates possible hideaways with arrows, which might help the children to guess the right places as in the following figure 3.

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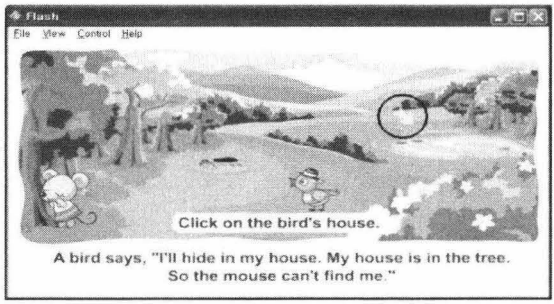
FIGURE 3
An Example of the Support from the Computer



With regard to the metalinguistic demand, it is difficult to find such demand, as the computer does not instruct. However, the children need to know how to control the computer mouse to proceed. The children's previous experience in using computers can help them to control it. Demands and supports in the story are summarized as follows:

TABLE 2
The Summary of Demands and Support of "Let's Play Hide and Seek"

Demands	Support
Cognitive -Understand the concept of the games, "Hide and Seek" and "scissors, rock and paper" -Know different living places for each animal	**Cognitive** -Familiar games -Familiar animals (Except the Mole)
Language -Understand the word meanings -Understand the discourse among the animals	**Language** -Animations and pictures -Changing the color of the text when it is narrated -Predictable structure of the story
Interactional -Need to click the right hiding places for each animal.	**Interactional** -Previous knowledge about the animals
Physical -Need to control the mouse pointer to click the arrow on the screen to proceed.	**Physical** -Previous experience with computers

This comparison shows the opportunities for learning in the story. This support appears to be not very explicit or dynamic. The computer cannot figure out what the children does not understand. It just provides information and the children need to notice the support and make use of it to help themselves. In comparison, supports from a person such as teachers seem to be more direct and focused. If the children miss the computer's support, the support is not successful. However, if the children miss a teacher's support, he/she may

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give them another chance to make use of it until the children succeed to understand.

It may therefore be said that, the support from the computer seems to be indirect and less noticeable than human's support. The support of the software requires a more active role by the learners. Nevertheless, the children seem to enjoy the story, as most of them said they liked the story in the survey.

In relation to the language support from the computer, four kinds of support were found such as pictures, animations, narration and interaction. However, not every picture or animation was helpful to understand the story. For example, in figure 3 above, all the objects in the picture do not directly support the text, but in the previous scene, the animation of the bird can explain the text, 'a bird says'. The number of each kind of support of the computer, which might be directly related to the text, can be found in table 3.

In addition, the story itself provides some kind of support. For instance, the repetitive structure of the story can provide clues. This type of repetition was found in seven occasions.

TABLE 3
The Number of Each Kind of Support Found in the Story

From the computer	From the story
Pictures: 4	Repetitive event: 7
Animations: 23	
Interaction: 4	
Narration: All sentences	

2) The children's use of the computer

While watching and listening to the computer story, the children did not say much. All of the children skilfully used their mouse to read the digital English story. No significant problem occurred. The children attentively watched their monitor screen during the reading session. The survey results provide interesting information about the children's use of the computer story. The children seemed to enjoy the story very much. Many of them commented that the pictures and the animations of the story were very interesting and all of them wanted to study again with a similar English story in the future.

Some of the children seemed to be affectively engaged with the story. They looked shocked together with the mouse when the snake came out from the rabbit's hiding place. Some of the children sometimes repeated the English words by themselves as if they were talking to the other animals.

3) The test results

Even though the test results are influenced by many factors such as the children's

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previous learning experience, and the test itself, they appear to show the overall effect of the support from the software. It is regarded as a positive effect of the reading, when the children answer correctly in the post-test, and wrongly in the pre-test.

I counted each successful result as one point. The total pre-test score for reading was 363, and the average score was 6.9, while the total post-test score for reading was 519, and the average score was 9.9 as in the following table 4. The t-test result shows that the difference between pre and post test score is statistically meaningful ($p<.05$).

The total pre-test score for meaning was 486, and the average score was 9.3, while the total post-test score was 659, and the average score was 12.7. The t-test result also shows that the difference between pre and post test score is statistically meaningful ($p<.05$) which means that the digital English story had positive effects on the test result rather than just a coincidental result.

TABLE 4
Test Result of the Reading (Reading/ Meaning)

Test item	Score					
	Pre-R	Po-R	Inc.	Pre-M	Po-M	Inc.
Bird	31	38	7	42	49	7
Frog	28	32	4	36	44	8
Fun	17	22	5	16	19	3
Hide and Seek	4	16	12	4	12	8
Hide, I'll count to ten.	8	12	4	5	12	7
I know, I know!	32	38	6	29	36	8
Let's do scissors, rock and paper.	25	34	9	31	37	6
Mole	11	24	13	8	20	12
Mouse	38	46	8	52	52	0
My house is in the tree.	28	35	7	28	34	6
My house is under the bush.	6	16	10	14	20	6
My house is under the water.	11	24	13	18	30	12
Rabbit	16	25	9	28	37	9
So the mouse can't find me.	10	16	6	19	24	5
That's a good idea.	11	17	6	27	38	11
The mole comes out from his house.	5	16	11	18	27	9
The mouse goes away.	9	14	5	8	15	7
The mouse wins the game.	16	17	1	22	34	12
Under the earth.	5	13	8	15	21	6
Where are they?	17	19	2	23	32	9
Woods	14	17	3	18	24	6
You are here in your house in the water, frog.	8	12	4	12	21	9
You are here in your house under the earth, mole.	13	16	3	13	21	8
Total score	363	519	156	486	659	174

*Pre-R: pretest reading, Po-R: post-test reading, Pre-M: pretest meaning, Po-M: post-test meaning, Inc.: increase

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The most improved test items in the reading test were 'Mole', 'My house is under the water', and 'hide and seek'. Similarly, the most improved test items in the meaning test were 'Mole', 'My house is under the water', and 'The mouse wins the game'.

In case of the word 'Mole' the major support was picture and narration. The result shows that many students who did not know the word succeeded to learn the meaning and how to read the word while watching the story. Although, the children learned those words and sentences while reading the story, their previous learning experience may aid their learning.

For the test item 'My house is under the water', the major support was animation and narration. The children appear to learn the meaning while watching the animation and manage to combine the meanings of English words together successfully. However, the increased score for the test item 'My house is under the bush' seems to be difficult for them to understand. The word 'bush' is neither distinctive to notice nor frequent in the story. The word may not be easy to encounter for the children in their previous experiences. In this case, the support from the digital English story was not very successful. For 'the mouse wins the game', the major support was animation. It shows a happily smiling rabbit after it finishes the game. The animation appears to be successful to teach the meaning of the sentence to the children.

4) The survey results

There were 8 questions in the survey. For the first and third questions, all of the children answered that they learned the meanings and sounds of new words from the story. Many children think that the story is helpful to learn the meaning of new words and sounds as shown in the second and fourth questions. More than 95% of the children think the story is interesting as asked in the fifth question. All of the children chose the interaction factor which helped them to understand the story. It appears that animation was also a useful support for the children to understand the meaning of the story. These results correlated with test results. Animation and interaction were also considered as interesting factors for the children as in question 7. All of the children answered that they want to study again with a similar kind of English story. It appears that the children were highly interested in studying with the digital English story.

TABLE 5

The Survey Result

Question	Options	Number	%
1. Did you learn the meanings of any new words from the story?	1) Yes	52	100
	2)No	0	0
2. Do you think the story is helpful to learn the meaning of new words?	1) Strongly	27	52
	2)A little	22	42

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	3)Not much	3	6
	4) Never	0	0
3. Are there any new words you learned how to read from the story?	1)Yes	52	100
	2)No	0	0
4. Do you think the story is helpful to learn how to read new words?	1) Strongly	30	58
	2)A little	22	42
	3)Not much	0	0
	4) Never	0	0
5. Do you think the story is interesting?	1) Strongly	19	37
	2)A little	29	56
	3)Not much	4	8
	4) Never	0	0
6. Choose the factors which helped you to understand the meaning of the story.	1) Pictures	44	84
	2)Animation	51	98
	3)Finding the animals' house	52	100
	4) Repetitive story	37	71
	5)Narration	34	65
7. Choose the factors which are interesting to you.	1) Pictures	4	8
	2)Animation	23	44
	3) Finding the animals' house	19	37
	4) Repetitive story	2	4
	5) Narration	4	8
8. Do you want to study again with this kind of digital English story in the future?	1)Yes	52	100
	2)No	0	0

5) Limitations

As this study is based on a sample from a small number of students, the results have many limitations. Thus, it is difficult to make broad generalizations from the results of this study. For example, the results of the test can be different if one uses different English stories or different multimedia stories. Also the test scores can be influenced by other factors such as previous learning experiences and the difficulty of the English story. In addition, the study could not analyse the effects of various types of interactive features due to the limitation of available digital English stories. Moreover, it was very hard to analyse the independent effects of different supportive features, since the results represent comprehensive effects of the digital English story. Thus it may be necessary to design more sophisticated research by using identical software except one supportive factor to compare. Then the results can be clearer in finding the effects of individual supportive features of digital English stories and more reliable to generalize.

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V. CONCLUSION

Although it was very hard to decide which feature is connected to which learning result, it seems evident that the overall effect of the digital English story was successful in relation to the results of the test and the survey. Through the research process and data analysis and the comparison with previous research results, the following suggestions were conceived to improve the effects of digital English stories.

Learners might have more chances to think and reflect on their reading if the computer can provide frequent meaningful interactions. This may enable the learners to broaden their English by connecting old and new knowledge and make use of the potential support. In addition, this interaction can provide appropriate feedback to the reader, if the computer story is programed in that way. Moreover, this interaction can give interesting activities to the children to let them find things and move objects to a certain place. In addition, it might be better if the animation can reflect the meaning of the text in as much detail as possible. If the animations are not clear or not related to the meaning of the story, the children cannot make use of the support. Thus the more detail the animation might be, the easier the children can understand.

Various types of supports are desirable to fulfil learners' needs. A teacher can give appropriate support when learners need it, whereas the computer cannot figure out the needs of learners. Thus the computer needs to be programed to meet all the needs of the learners and provide them with appropriate information such as the meaning and sound of words. In addition, it might be better if the support can be immediate rather than delayed. For example, when the computer gives word meanings, it is better if the meaning can be shown on the same page of the story rather than on a separate window, which requires running another program. If learners need to spend a long time to get support, they may not use it frequently. It is also considered better to have various units of narration such as whole page text narration, sentence unit narration and word unit narration, since various units of narration can be more suitable for various needs of the children.

It might be better if the computer let the children notice their errors and correct the errors. In other words, if the computer can correct learners' errors in an interesting way, they do not feel embarrassed or intimidated. This might be one of the most interesting kinds of interaction with computers, whereas the corrections of learners' errors through social interactions sometimes make the learners become uninterested and embarrassed.

The benefits of digital English stories can be doubled, when adults as well as computers support learners at the same time. However, these suggestions might need further research to be generalized, due to the limitations of this study. More research into the effects of each supportive feature should be conducted to figure out the effective ways of designing them in the future.

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REFERENCES

Allahyar, N., & Nazari, A. (2012). Potentiality of Vygotsky's sociocultural theory in exploring the role fo teacher perceptions, expectations and interaction strategies. *WoPaLP, 6*, 79-92.

Anderson, J. (1992). Living books and other books without pages. *Unicorn, 18*(3), 64-67.

Bruner, J. S. (1978). The role of dialogue in language acquisition. In A. Sinclair, R. J. Jarvelle, & W. J. M. Levelt. (ed). *The child's concept of language* (pp. 241-256). New York: Springer-Verlag.

Cooper, B. (2003). The ripple project - The whole school impact of conducting learner-centred ICT projects in infant classrooms. In British Educational Communications and Technology Agency, *ICT Research Bursaries: A Compendium of Research Reports* (pp. 45-51). London: Dept. for Education and Skills.

De Jong, M. T., & Bus, A. G. (2003). How well suited are electronic books to supporting literacy? *Journal of Early Childhood Literacy, 3*, 147-164.

Driscoll, M. (2000). *Psychology of learning for instruction*. Needham Heights, MA, Allyn & Bacon.

Garvie, E. (1990). *Story as vehicle: Teaching English to young children*. Clevedon: Multilingual Matters LTD.

Ghosn, I. (2002). Four good reasons to use literature in primary school ELT. *ELT Journal, 56*(2), 172-179.

Grimshaw, S., Dungworth, N., McKnight, C., & Morris, A. (2007). Electronic books: Children's reading and comprehension. *British Journal of Educational Technology, 38*(4), 583-599.

Hedberg, J. (2004). Designing multimedia: seven discourses. *Cambridge Journal of Education, 34*(2), 241-256.

Hong, Myung-Eui & Huh, Keun. (2011). A study on the way of elementary English reading instruction using Internet-based fairy tales. *Modern Studies in English Language & Literature. 55*(1), 227-54.

Im, Kyung-Bin. (2009). An analysis of digital English stories in the view of sociocultural theories. *English Language & Literature teaching, 15*(1), 271-297.

Im, Kyung-Bin. (2010). An analysis of supportive strategies in shared reading using an English story. *English Language & Literature teaching, 16* (2), 45-72.

Jang, Dong-Hyeon. (2008). *A study on utilizing electronic fairy tales*. Unpublished master's thesis. Gyeong-in National University of Education.

Jeon, Eun-ju. (2004). *The effects of elementary English teaching in utilizing electronic fairy tales*. Unpublished master's thesis. Gyeong-in National University of Education.

Kim, Hye-Ryun. (2003). The effects of story reading on a beginning learner's acquisition of

교보문고 KYOBO Book Centre

English vocabulary: A case study of a 6-year-old child. *Foreign Languages Education, 10*(2), 155-181.

Kim, Eun-Hye. (2005). *The effects of task-based storytelling activities on 3rd Graders' English speaking and listening abilities*. Unpublished master's thesis. Jeonju National University of Education.

Kim, Hyeon-Ock, (2008). *A study on developing English reading skills for elementary students through planning and applying for the reading activity program using the fairy tales*. Unpublished master's thesis. Gyeong-in National University of Education.

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, 50*(1), 110-124.

Korat, O., & Blau, H. (2010). Repeated reading of CD-ROM storybook as a support for emergent literacy: A developmental perspective in two SES groups. *Journal of Educational Computing Research, 43*(4), 445-466.

Lee, Ki-Jin. (2007). *A study on improvement of reading ability by bookmaking using English books on the Internet*. Unpublished master's thesis. Korea National University of Education.

Lee, Hyun-ju. (2009). *The effect of teaching the reading of sight words using an English story on the Internet in an elementary school*. Unpublished master's thesis. Korea National University of Education.

Lewin, C. (2000). Exploring the effects of talking book software in UK primary classrooms. *Journal of Research in Reading*, *23*, 149-157.

Long, G. (2007). *Transmedia Storytelling*. Kenyon College, Kenyon, Ohio.

Loukia, N. (2006). Teaching young learners through stories: The development of a handy parallel syllabus. *The Reading Matrix*, *6*(1), 25-40.

Mercer, N. (1995). *The guided construction of knowledge: Talk amongst teachers and learners*. Avon: Multilingual Matters Ltd.

Moore, M. G. (1989). Three types of interaction. *The American Journal of Distance Education,3*(2), 1-6.

Park, Soon-Ok. (2006). *The effects of teaching reading using literary tests on reading ability and attitude in elementary English education*. Unpublished master's thesis. Gyeong-in National University of Education.

Rose, E. (1999). Deconstructing interactivity in educational computing. *Educational Technology, 39*(1), 43-49.

Stockle, Kelly. (2012). Page turning and mouse clicking: A comparison of eBooks and an adult reader on comprehension measures. *Rising Tide*, 5.

Su, B., Bonk, C., Magjuka, R., Liu, X., & Lee, S. H. (2005). The importance of interaction in web-based education: A Program-level case study of online MBA Courses.

교보문고 KYOBO Book Centre

Journal of Interactive Online Learning. 4(1), 1-19.

Vilaseca, R., Basil, C., Reyes, S. (2013). Exploring the effects of computer software for teaching reading and writing skills in young children. *Wyno Academic Journal of Education Research and Essays. 1*(3), 18-31.

Wagner, E. D. (1994). In support of a functional definition of interaction. *The American Journal of Distance Education, 8*(2), 6-29.

Wagner, E. D. (1997). In support of a functional definition of interaction. *New Directions for Teaching and Learning, 71*, 19-26.

Wertsch, J. (ed) (1985). *Culture, communication, and cognition: Vygotskian perspectives*. London: Cambridge University Press.

Widdowson, H. G. (2003). 'Expert beyond experience': Notes on the appropriate use of theory in practice. In Newby, D. (ed). *Mediating between theory and practice in the context of different learning cultures and languages* (pp. 23-30). Council of Europe Publishing. Graz, EU.

Examples in: English
Applicable Languages: English
Applicable Levels: Elementary

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Received in January 15th, 2014
Reviewed in February 26th, 2014
Revised version received in March 5th, 2014

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