Digital Storytelling Technology for Developing Schema for ESL/EFL Reading Comprehension

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The purpose of this paper is to discuss how in-service teachers can employ digital storytelling technology for helping ESL/EFL learners to become proficient readers. In order to accomplish this purpose, this study investigates what digital storytelling is and the potential of digital storytelling for teaching ESL/EFL reading in terms of the development of schema. In addition, this study provides information about the digital storytelling software applications. Along with the theoretical aspects of digital storytelling, finally, this paper suggests some practical principles of effective creation of digital stories and states some limitations of digital storytelling that English teachers need to consider.

1. INTRODUCTION

Every text in a society presupposes the cultural knowledge, social attitudes, content knowledge or the views of a particular segment of its society shared by its members. Irrespective of types of texts, every text always takes something for granted, leaving blanks to be filled in by the listeners and readers to make it comprehensible (Hirsch, 2006). This means that you cannot be a proficient reader without filling in the ‘blanks’ or internalizing the shared knowledge of the speech community where texts come from. In terms of English language teaching and learning, what this implies is that in order for English language learners to comprehend their target language texts, they need to acquire the background knowledge and develop broad schema about their target language community. Thus, when
they approach a reading with little or no schema for events or contexts, their comprehension often remains at a surface level and an awareness of the relative importance of concepts within texts remains unanalyzed.

Traditionally, to scaffold reading in ESL/EFL classrooms, English teachers use classroom-based materials and activities through whole-class instruction. Graphic organizer, parallel reading of simpler texts, pre-reading questioning, prediction questions, and showing visual materials are often employed to help their students enter a reading text by previewing the content material that will appear in the readings (Echevarria, Vogt, & Short, 2008). Although these instructional strategies are effective in assisting students in gaining entrance to the reading, traditional reading scaffolding is not sufficient to prepare ESL/EFL learners for challenging readings. For instance, traditional materials that aim for activating background knowledge such as photographs and pictures from printed materials just allow students to be exposed to their target language cultural images, but mere exposure is not sufficient to develop schema for reading; the integration of voice and word within meaningful contexts is necessary for ESL/EFL learners, especially those who are new to the target language culture, in order to understand the connotations of cultural images.

Taking into account of the limitations of traditional ways of scaffolding ESL/EFL reading comprehension, it is necessary for ESL/EFL educators to find an innovative and effective alternative that can help students to develop schema for reading comprehension. One promising way is the use of digital storytelling technology, a technological method of providing ESL/EFL learners with the cultural and content knowledge needed to comprehend challenging texts by using software applications that allow users to create digital stories. The most distinct feature of digital storytelling technology that differentiates it from traditional ways of scaffolding reading is that all of the learning components needed to scaffold reading—cultural images, texts, sound effects, teachers’ narration, background information—are integrated into a single media production. Thus, the purpose of this study is to investigate how in-service teachers can employ digital storytelling for scaffolding ESL/EFL learners to become proficient readers. In order to accomplish this purpose, this study discusses what digital storytelling is and explores the potential of
digital storytelling for teaching reading for ESL/EFL learners in terms of the development of schema. In addition, this study provides information about the digital storytelling software tools. Along with the theoretical aspects of digital storytelling technology, this paper suggests some practical principles of effective creation of digital stories and states some limitations of digital storytelling.

II. WHAT IS DIGITAL STORYTELLING?

Digital storytelling is the telling of stories in digital or electronic format. As its name implies, digital storytelling uses digital devices, software applications and multiple types of media such as text, image, voice (narration), music, and/or video to tell stories and share them. By combining multiple media, digital storytelling enables users to create various types of texts like slide shows with voiceovers, movies, or simple written texts with special effects and transitions. Along with this definition, there are many other definitions of digital storytelling. According to the Digital Storytelling Association (2002), digital storytelling is the modern version of the traditional art of storytelling using digital media to construct texts to tell, share, and preserve. Ohler (2008) describes digital storytelling as the use of personal technology in order to integrate a number of media into a coherent narrative. Robin (2008) also defines it as a process of connection in which teachers collaborate with students “to help them harness the power of voice and imagery to connect people to their community by using technology that is relevant to the way we live today” (p. 429). He adds that digital storytelling is a story-creating process that allows students and teachers not only to help them to cultivate the ability to cooperate with others, but also to foster the information gathering and problem-solving skills. In sum, digital storytelling is a creative way of telling stories by combining images, texts, sounds, and movies to tell and share the users' stories in a digital format.

As its digital features, digital stories can be saved as digital movie files for playback on a computer or other digital devices. They can be also exported to the Internet and/or DVD, which makes it possible for digital stories to be displayed and shared. These days, the lower cost of digital devices and the
development of easier media creation software add popularity to the digital storytelling approaches (Meadows, 2003).

III. WHY DIGITAL STORYTELLING FOR DEVELOPING SCHEMA?

ESL/EFL researchers have defined L2 reading comprehension in many ways. In the past, text-relevant factors or bottom-up processing had been emphasized in the process of reading comprehension. However, the views of recent research on reading comprehension have focused on reader-factors as well as text-relevant factors. In this view, reading is an interaction between readers and texts. Meaning is formed through active interaction between readers' background knowledge and information in the text. This means that a reader may have difficulty comprehending a text if the reader can't make active use of his or her background knowledge about the text.

With respect to the role of background knowledge in reading comprehension, Coady (1979) makes a famous psycholinguistic model of ESL reader which stresses the importance of background knowledge in reading comprehension. Coady argues that the reader's background knowledge interacts with his or her innate conceptual abilities as well as with his or her mental processing strategies in order to ensure comprehension of a text.

![Figure 1: Model of ESL Reader (Coady, 1979, p. 7)](image)

Coady also states that readers use these factors differently in accordance with their language proficiency. For instance, beginner-level readers focus on process strategies (i.e., word recognition), while advanced readers have interest in conceptual abilities or utilize their background knowledge more. Thus, Coady stresses that unskilled readers should use background
knowledge to make up their process strategies and conceptual abilities.

Like Coady's model, ample evidence suggests that background knowledge of the content of a text is significant in comprehending the text (Alderson & Urquhart, 1983; Pearson, Hansen & Gordon, 1979; Chiesi, Spilich & Voss, 1979). So, ESL/EFL teachers need to help their learners enter a reading text by scaffolding the background information and essential vocabulary prior to reading in order to lessen the gap between what they know and what they need to know to comprehend the text (Echevarria, Vogt, & Short, 2008). For instance, ESL/EFL teachers often use photos and pictures relevant to the content of the text to activate prior knowledge, previewing what will appear in the text (Roney, 2010). They also use other ways to scaffold reading: (a) look at and discuss pictures, movies, or slides; (b) look at the title and first paragraph and encourage students to think about the topic; (c) discuss new or difficult vocabulary with the students; (d) provide key word/concept activities; (e) answer questions about the subject of the text; (f) elicit what students know about the subject of the text, what they don't know, and what they would like to know (Finocchiaro, 1989). Teachers also use the activities of making a word map with essential words from a text, guessing the content of a text with a randomly-chosen sentence, and watching a movie or play related to a text.

Although these instructional strategies are proven to help ESL/EFL learners to gain entrance to the reading, the conventional ways of providing background information and activating prior knowledge have limitations in presenting various learning resources at a time. Teachers cannot provide ESL/EFL learners with multiple, repeated exposures through written and oral-aural modalities which are essential for them to deeply understand the text (Roney, 2010). In other words, traditional ways of providing background knowledge and activating schema may not be sufficient to prepare the English learners for challenging readings. Furthermore, once ESL/EFL learners leave schools, they cannot access the reading scaffolding even if they want to get assistance for their reading outside the classroom.

How can EFL/ESL teachers overcome the limitations of the traditional ways? How can they provide background information more effectively and efficiently? The use of digital storytelling technology is a promising solution
in that it can integrate all the learning components (i.e., content-related information, culturally-situated images, key vocabulary, etc) in a single media production by incorporating different media such as text, audio, music, photos, and images, which is impossible to do in the traditional reading scaffolding activities. With the use of digital technology, moreover, the digital stories for providing background knowledge can be uploaded to websites, so learners can access them whenever they want to view them outside the classroom. As the digital stories can be also stored in CD, DVD, or other digital devices and sent home for struggling learners, they can use them over and over again. In other words, ESL/EFL learners can have repeated access to the reading scaffolding via digital format instructional materials that can be replayed until they achieve the appropriate level of understanding the texts.

In sum, digital storytelling technology can be an effective and efficient alternative to the schema development activities of traditional classroom by providing English language learners with multi-modal opportunities to be exposed to multiple media related to the content of readings and to repeatedly have the reading scaffolding supports at anytime and anywhere they need for comprehending texts.

IV. HOW TO START: PROGRAMS FOR CREATING DIGITAL STORIES

In order to create a digital story, tools (software or application) are necessary to transfer a story to a computer. There are many different software applications for creating digital stories. Some are free and already included in the operating system of computers. Others can be purchased for a reasonable price. Although it is up to the choice of users, any software tools that integrate images, sounds, narrations, and texts can be used for creating digital stories. In this respect, Powerpoint and even MS–Word can be tools for turning a story into a digital one. However, many easy programs let users make their digital stories by just clicking buttons several times. Here are the kinds of free but excellent media production software that ESL/EFL teachers will need to create the digital stories for providing schema for reading. Each is addressed in turn including advantages and shortcomings.
1. **Movie maker**

For PC users, the most well-known media creation software is Windows Movie Maker which is a free but excellent media creation tool for combining images, movies, audio, and music. Although it lacks sophisticated features, its general capabilities and availability make it popular among many users. One limitation is that it only exports movie files in the WMV and AVI formats, so you cannot share your digital stories with Macintosh users.

2. **Photo story**

It is also a good choice for PC users because this program is simpler and easier than Movie Maker. In spite of its simplicity, the tool enables you to easily edit your images and add voices and music. You can even touch-up, crop, or rotate photos and add special effects and record your narration to the image. However, the application has less sophisticated features than Movie Maker. Moreover, it cannot import video clips.

3. **iMovie**

For Macintosh users, iMovie is equivalent to Movie Maker. It is a powerful software tool for creating digital stories. Like the PC user software tools, iMovie let users add and edit images, titles, music, voices, and transitions by dragging and dropping the ready-made functions over the images. However, iMovie is not a free application and only supports .MOV format video clip, so you cannot share your digital stories with PC users.

4. **VoiceThread**

Irrespective of the types of computer operating systems, VoiceThread, a collaborative, multimedia Internet-based slide show tool, can be used for creating digital stories. Like most of the software tools above, VoiceThread holds images, texts, music, and voice. Unlike them, however, users can leave their comments using texts, voice, and video. One limitation of VoiceThread
is that you need access to the Internet and an account to watch slide shows and leave comments.

5. Slidestory publisher

This application is another option for the PC users who looks for another free online storytelling tool. It is like online PowerPoint presentations, but you can make a narration and comment on the slides. By adding photos, a title, description, and some tags, you can publish your digital story with one click of a button to the Slidestory.com website. However, Slidestory Publisher has some limitations. Most of all, as the application is a simple and basic program, it lacks sophisticated functions. Furthermore, you need to create your own account to publish your digital stories. This means that you need access to the Internet to share the slide show presentation.

6. Prezi

Prezi is a cloud-based presentation software that incorporates images, videos, YouTube videos, PDFs, or other digital media. It is also possible to convert PowerPoint slides into PDFs and upload them to a Prezi. This Zooming User Interface (ZUI) storytelling tool has pan and zoom function which is effective for visualizing ideas and stories by zooming-in on a detail or zooming-out to show the big image. In addition, the presentation tool allows users to present online or download and show the digital stories. However, the web-based presentation software is lack of font and color options. Moreover, users with the free license must publish their presentations on the Prezi.com website, which means that free users cannot make their work private and only online editing is allowed.

V. PRINCIPLES FOR EFFECTIVE CREATION OF DIGITAL STORIES

On the previous page, useful software applications for creating digital stories were introduced. Most people would use iMovie, Movie Maker or Photo Story for their availability and simplicity, but advanced users want to
use more sophisticated software tools like Premier or Final Cut Pro. No matter what software tool you use, however, there are some important principles to follow in order to effectively create digital stories for providing schema for ESL/EFL reading.

1. Think about the purpose of using digital storytelling.

Using digital storytelling, teachers and students should not start with the notion. “I want to make a digital story and now I need to find an appropriate unit.” or “I need to use digital storytelling skills to help my students improve their English in this unit.” Rather, they should start by considering how their given tasks can be best accomplished. Digital storytelling is an available instructional or learning tool of technology for teachers and students to use for performing the task of a unit or a project. In reference to this, Bentham (2008) argues that teachers need to be able to set a task apart from a tool when they integrate technology or media production into their curriculum. This is because technology tools are not the means to an end. They are means to a specific set of tasks, thus teacher and students must be aware that a task is not the same as the tools used to support the task (Jessica, 2010). This implies that if students fail to tell apart tools from tasks, they may confuse what they are learning. For teachers, they may mislead their classes and students (Beatham, 2008).

2. Begin by analyzing the content of the reading.

As one of the main purposes of using digital storytelling for teaching ESL/EFL readers is developing schema to scaffold reading, teachers need to analyze what background knowledge about the content of the reading students need to understand. They should also analyze what background knowledge of the content of reading is assumed and what background knowledge their students have already had. In other words, teachers should decide what background knowledge or dimensions of culture they need to provide before making a storyboard for their digital stories. In addition, teachers are required to decide which key terms and phrases of the texts their students
are going to read are the most crucial for them to comprehend the main ideas of the reading. This is because it is impossible to pre-teach all the words in a text that students may not know. Teachers should also concentrate their efforts on deciding which vocabulary their learners are unlikely to encounter in their own real life communication. The vocabulary may be the same words or phrases as the key terms or phrases, but they may not be. Generally, the amount of key vocabulary to embed is no more than 10 to 12 (Roney, 2010).


Storyboarding is like an overall plan for creating a digital story. In other words, the most important advantage of storyboarding is that it creates an efficient blueprint for the digital stories. While storyboarding, teachers structure their digital stories, decide images, sounds, and music to use, and compose a script. Without this fundamental process of creating digital stories, users may spend significant amount of time compiling their digital products. In other words, well-planned storyboarding enables users to save production time. Moreover, it also allows users to easily revise their work when necessary as the storyboard shows the entire components of the digital story.

4. Find images that best provide visual background information.

As mentioned in the previous section, mere exposure of images to ESL/EFL learners is not sufficient to help them to develop visual schema for better reading comprehension. Thus, in creating digital stories for providing background knowledge for English learners, teachers need to find images that are both iconic in the target language culture and provide effective visual background information. As the visual information in symbols of the images is highly culturally situated, teachers need to scaffold reading for ESL/EFL learners by offering pictures or photos that contain abundant visual cultural information.
5. Record voiceover (narration) at a slow but natural pace.

Generally, ESL/EFL learners’ English proficiency level is not high enough to process spoken discourses while processing written messages. Thus, ESL/EFL instructors should carefully and consciously control their speaking pace in order for their learners to make the messages comprehensible. This implies that it is essential for teachers to record the voiceover at a slow, natural pace and articulate words as clearly as possible during the voiceover recording. In addition, teachers need to vocally highlight the key vocabulary, which provides ESL/EFL learners with appropriate and comprehensible language input for them to be familiar with the vocabulary in the future reading.

VI. SOME LIMITATIONS OF DIGITAL STORYTELLING

As discussed above, digital storytelling has a great potential in developing schema and expanding reading comprehension. However, digital storytelling has some limitations that teachers need to consider in employing digital storytelling approaches in teaching reading comprehension. Most of all, teachers and students need access to computers and digital storytelling-making software applications. Particularly, teachers should not take students’ access to a computer for granted in having students create digital storytelling given the fact that access to computers remains unevenly distributed and schools in the impoverished areas and homes in the poorest regions lack even the basic digital resources like computers (Davidson & Goldberg, 2009). Alternatively, as many students have their own digital devices like cell phones, MP3 players, PMP(Personal Media Player) that have the functions of recording voices, taking pictures and movies, and editing multimedia, teachers can minimize the digital divide by utilizing the digital tools students have.

Along with the problem of access to computers and digital devices, digital storytelling requires a level of technical expertise; both teachers and students need to know how to use the software tools. Even though the software applications introduced in the previous section are well-known for
their user-friendliness, it takes time to get used to the functions of the software applications. It is not advisable to use a professional sophisticated software program until you use the simple editing program easily and quickly. Moreover, teachers should be aware of the fact that not all students are accustomed to digital production. Teachers often assume that their students have little trouble using digital technology (Buckingham, 2007). In reality, their digital and technology experiences vary depending on their socio-economic background. In terms of teachers’ technological expertise, they are not necessarily technological experts within a “community of learners” (Parker, 2010, p. 54). Another teacher, parents, or even students can share their specific knowledge of media production, which “open up the possibility to create a community of learners made up of both teachers and students working together for a common goal” (Ibid.).

On top of the limitations discussed above, creating a digital story is time-consuming like most technology-based activities do—especially, at the first attempt—although the production time depends on the length and complexity of the production and desire for perfection and artistry (Roney, 2010). However, time investment in creating digital stories significantly decreases with repeated composing. In addition, as the created digital stories can be used repeatedly during the years of the curriculum, teachers can save time in the long term. Finally, as with all other digital productions, digital storytelling production once published online can be easily copied and used for the wrong purposes and be exposed to a host of unknown people who may leave hurtful criticism, infringing on personal privacy as storytelling is inherently personal. Thus, teachers should let students know what will happen to their digital production, how their digital stories are used, and what teachers will do to prevent the misuse of digital stories from happening (Reinders, 2011).

VII. CONCLUSION & SUGGESTIONS

As previously discussed, digital storytelling technology can provide ESL/EFL students with effective pre-reading experiences by engaging them in the content and developing schema that they would need to access the
future reading of texts. In other words, digital storytelling technology can provide background knowledge and pre-teach essential words and phrases that help ESL/EFL learners contextualize the reading they are going to read. Digital storytelling technology can also incorporate all the learning elements into a single digital production, so it enables ESL/EFL learners to be exposed to multiple multimodal resources, which is critical for deeply understanding texts. In sum, digital storytelling can serve as a powerful tool to engage ESL/EFL learners in active learning, making the learning interesting and motivating.

In spite of the promising potential of digital storytelling technology, teachers need to be cautious of integrating this technology into classroom as technology inherently brings unintended consequences or even worsens the problems we want to solve by the technology because technology brings changes in social processes and patterns of activity (Burbules and Callister, 2000). On top of this, no matter how effective digital storytelling technology is, teachers need to be reminded that there is no one-size-fits-all technological solution because every teacher or every course is situated in different educational context. Therefore, ESL/EFL teachers, who want to incorporate digital storytelling into their classroom, need to have subtle understanding of the complex relationship between technological pedagogical content knowledge and use this understanding for developing appropriate and context-specific digital stories for developing schema that English language learners need to comprehend texts.

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