

**Exploring the Effects of Digital Storytelling: A Case Study of Adult  
L2 Writers in Taiwan**

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### Abstract

With the advent of information communication technologies, an escalating number of youths is communicating, creating, and sharing narratives via Web 2.0 social networks. To ensure the continuity between in-class and out-of-class literacy practice, digital storytelling has become increasingly prevalent in educational settings. Digital storytelling has the potential to enhance digital literacy and self-efficacy through innovative learning and identity expressions. However, the research at this juncture is scarce. Therefore, this study incorporated Storybird, a Web 2.0 collaborative writing tool, into a freshman composition class to cultivate digital literacy in English among 18 college students who are studying English as an International Language in Taiwan. In addition to developing digital literacy, this study also explored the effects of Storybird-mediated storytelling on English as an International Language students' self-efficacy as a legitimate user of English. The results from both the quantitative and qualitative data analyses indicate that after year-long participation in Storybird-mediated digital storytelling, the majority of the participants rated their digital literacy in English higher than before. Similarly, they developed a stronger sense of confidence as English as an International Language writers. Some pedagogical considerations are offered at the end of this paper for those who wish to incorporate Web 2.0 tools into their English as an International Language classrooms to boost their pupils' confidence in participating in this ever-connected global community.

*Keywords:* English as an international language, digital storytelling, self-efficacy, digital literacy, L2 writing, Storybird

The rapid development of information communication technologies (ICT) in our modern society has transformed the ways people communicate with one another. Since human communication is mostly through the medium of language, as the technology advanced, language is becoming inseparable from the digital environment (Hockly, 2012, p.110). This phenomenon has brought attention to the scholars to reevaluate the existing literacy skills that were taught in current educational systems (Churchill, 2016; Potts, 2013). Many educators agree that new skills are required to comprehend and communicate using new technologies (Hockly, 2012). As a result, English as International Language (EIL) learners in the 21st century not only need to learn the language but also need to learn to communicate and utilize the language efficiently in the digital environment. This need becomes even more vital given the newly defined digital divide between those who are passive consumers of media and those who are proactive discerners and creators of media (Thomas, 2016).

Due to the widespread of ICT over the past decade, numerous researchers endeavored to conceptualize or describe the development of digital literacy (Eshet-Alkali & Amichai-Hamburger, 2004; Potts et al., 2010, Ferrari, 2012). This trend also brought an urgent need for developing digital literacy in a global society. Many governments or cross-national confederations, such as the European Union, emphasized the importance of digital literacy in the educational system (Churchill, 2016; Leahy & Dolan, 2010; Poore, 2011). The Ministry of Education (MOE) in Taiwan also recognized the importance of digital learning and included the development of information communication technology (ICT) skills in its educational guidelines (MOE, Taiwan, 2012). Much research has hypothesized a close relationship between digital storytelling (DST) and digital literacy (Karakoyuna & Kuzub, 2013; Robin, 2016; Thang et al., 2014. ) and supported the connection between the use of DST and students' engagement and motivation for learning (Pop, 2012; Sylvester & Greenidge, 2009; Yang & Wu, 2012). However, fewer studies have scrutinized the link between DST and self-efficacy among EIL users. Therefore, the present study not only connects DST with several types of digital literacy, but also relates it to the learner's sense of confidence. The digital literacy under discussion in the current study comprises a set of skills that are essential for decoding and making meaning out of the digital texts (Churchill, 2016). In other words, these skills involve critical thinking, language ability, and communicative skills, so-called 21st Century Skills (Brown, Bryan, & Brown, 2005; Jakes, 2006). The present study intends to answer the following three research questions:

1. Is there any significant difference in university EIL students' self-rated English digital literacy before and after their participation in Storybird-mediated digital storytelling?
2. How does DST affect participants' self-efficacy as EIL users after taking part in Storybird-mediated digital storytelling?
3. What are the participants' perceptions of integrating Storybird into their L2 writing class?

### **Significance of the Study**

The results from this study contribute to the pedagogical application of DST and theoretical understanding of DST in the L2 writing context. Students nowadays are far more interested in continually engaging themselves in participatory social networks out of school than academic learning in school. The current results show that integrating DST into a formal composition class created engaging and meaningful literacy practices in class, which in turn cultivated EIL writers' digital literacy and sense of confidence. The current results shed light on the relationships among DST, L2 digital literacy, and L2 self-efficacy. Most importantly, the

ultimate outcomes of this project, the field-tested DST integration guidelines, and the empirically grounded implications, help provide English language teachers with the ability to think about and use technology in creative and culturally-responsive ways. The overall findings help language educators arrive at a deeper understanding of the substantial roles that DST can play in cultivating various aspects of digital literacy and boosting up writing-related self-efficacy as a language learner.

## Literature Review

### Digital Literacy

Literacy has evolved historically from classic literacy (reading-writing-understanding) to audiovisual literacy to digital literacy or information literacy and recently to new media literacy. With the advent of the new literacies, today's reading and writing instruction are influenced by the change in even more profound ways. Due to their inherent characteristic of change, a precise definition of the "new literacies" seems unfeasible. Nevertheless, teachers and researchers agree that today's students need and deserve the skills, strategies, and insights to successfully exploit the rapidly changing information and communication technologies that continuously emerge in our world (Leu, 2000; Street, 2003). Digital literacy is also called *21st Century Literacy*, *Digital Age Literacies*, and *21st Century Skills* (Brown, Bryan, & Brown, 2005; Jakes, 2006). According to Ferrari (2012), "Being digitally literate implies the ability to understand media (as most mediums are digitalized), to search and think critically about retrievable information (with the widespread use of the Internet) and be able to communicate with others through a variety of digital tools and applications" (p. 16).

Given the EIL context and the chosen platform of the present study, digital literacy here refers to the following types of literacy, namely information literacy, reproduction/visual literacy, language-based literacy, and connection literacy. The first two were adopted from Eshet-Alkalai et al. (2004), whereas the latter two were delineated by the researcher. Eshet-Alkalai et al. (2004) proposed that digital literacy can be categorized into five cognitive skills: photo-visual literacy, reproduction literacy, branching literacy, information literacy, and socio-emotional literacy. The current study adopted information literacy and combined reproduction and photo-visual literacy into one category due to their relevance to the current context. First, information literacy is defined as the ability to evaluate and assess information accurately, which is vital for information consumers in this information-overflow era. While surfing the Internet or navigating through digital databases, users face the difficulty of evaluating the credibility and originality of information. Therefore, users rely on their information literacy to make educated and intelligent assessments of information (Eshet-Alkalai et al., 2004). Information-literate people are skilled in critical thinking and are skeptical of the quality of information. Also, Mardis (2002) argued that information literacy is like a filter that distinguishes incorrect, unrelated, or biased information and avoids its influences on users' cognition. Second, reproduction/visual literacy is the ability to create new interpretations by using pre-existing information from different media such as texts, visuals, and audio. Reproduction literacy is vital in writing and art. In writing, people can reorganize and rearrange pre-existing sentences to produce distinct implications. In art, people can edit and combine visual or audio materials to make new creations (Eshet-Alkalai et al., 2004). Third, language-based literacy refers to EIL's students' ability in exploring, discerning, and utilizing English information from web 2.0 sources. The innovation of the Internet provides space for people to communicate and share information/knowledge with others. However, the Internet also presents many traps, such as hoaxes and malware. In general, English language-based literacy is the ability to make a sound judgment of various English-mediated online sources and identify

Internet traps. Finally, connection literacy pertains to EIL students' capacity of branching out to English-mediated cyber world with aims to communicate with other English speakers, establish a connection with them, and professionally collaborate with them. In other words, connection literate users are capable of sharing data with others, evaluating information, and collaboratively constructing knowledge with others.

### **DST and its Educational Benefits**

DST can be traced back to the late 1980s when new media technologies were merely just around the corner. DST is not a new invention. Joe Lambert (2002) helped establish DST as the co-founder of the Center for Digital Storytelling (CDS), a non-profit, community arts organization for new media and civic engagement in Berkeley, California. Since the early 1990s, Lambert and the CDS have offered training and assistance to those who were interested in creating and sharing their personal narratives (Center for Digital Storytelling, 2005). The development of DST highly relates to the evolution of internet technology known as *user-contributed content*, *social media*, and *Web 2.0* (Robin, 2016). Through Web 2.0, people transformed from “one-to-many” communication to “many-to-many” communication on the Internet (Roush, 2006). Similar to traditional storytelling, digital stories relate to specific topics and usually generate unique ideas (Robin, 2016). The definition is somewhat agreed upon; nevertheless, the uses of DST for learning have been quite diverse. Some educators use DST as a way to cultivate digital literacy, while others utilize it to motivate students to write. Both endeavors have been relatively successful for students in various educational contexts.

Many studies show that DST bears a positive impact on digital literacy. For instance, Robin (2016) claimed that students' technology literacy was enhanced as they added texts, images, audio, and video into their digital stories, whereas Sylvester and Greenidge (2009) found that students tended to employ both old and new literacies while creating digital stories. Thang et al. (2014) claimed that DST helped enhance students' language literacy, communication literacy, and media literacy. Besides, creating digital stories not only enhances students' digital literacy but also helps them achieve school-based curriculum goals (Karakoyuna and Kuzub, 2013). Besides academic gains and strengthened digital literacy (Alameen, 2011), DST also exerted its influence on L1 and L2 language learning (Yoon, 2013; Potts et al., 2010; Xu et al., 2011). Yoon (2013) looked into how DST affected the 5th-grade ELL students' English learning and concluded that students' learning motivation and reading comprehension were improved. Moreover, Potts et al. (2010) conducted an experimental study in a language arts class with a group of second grade, multi-lingual students in the US. They reported that DST engaged students in a meaningful social context in which their collaborative learning was promoted (Potts et al., 2010, p.190). The DST experience also boosted students' learning motivation. The above studies suggest that DST has the potential to enhance digital literacy, cultivate academic gains, facilitate language learning, and boost up learning motivation.

### **DST and Empowerment**

Besides its facilitating effects on digital literacy, language development, and learning motivation, DST has been used as a means of empowerment for marginalized voices across community-based projects worldwide. Xu, Park, and Baek (2011) examined the effects of DST on writing flow and self-efficacy in the virtual reality learning environment where sixty-four undergraduate Korean students were recruited to participate in the study. The results show that their writing self-efficacy and flow improved after engaging in DST (Xu et al., 2011, p. 188). Yoon (2013) found similar results in his study as he investigated the effects of storytelling on L2 learning attitudes and reading comprehension. Different from Xu et al. study, the participants in this study were 32 EIL 5th graders in South Korea. In addition to the

improvement of writing self-efficacy, this study also indicates that DST is instrumental in improving students' reading. In sum, the studies reviewed in this section point out a positive influence of DST in learning motivation and writing efficacy among L2 learners (Alameen, 2011; Potts, 2013; Xu et al., 2011; Yoon, 2013). These findings suggest that DST can be a valid tool for educational purposes. Aside from merely encouraging students to write, educators see digital stories as an empowering mechanism to provide a voice to those who are typically marginalized (Yuan et al., 2019).

The similar empowerment effect is very likely to take place with EIL participants when their writings are shared publicly through Storybird. In other words, integrating DST with the English composition class has the potential to boost EIL participants' confidence to compose and communicate in English as an empowering pedagogy. DST has been utilized as an empowering pedagogy in educational settings. For example, teachers delivered subject matters through digital stories and empowered the students by asking them to be the storytellers (Liu, Tai, & Liu, 2018). Creating digital stories encourages learners to develop their voices instead of merely imitating others' words (Al-Qallaf & Al-Mutairi, 2016). To be a good storyteller, a learner strives to integrate his/her intentions and perspectives into digital stories (Bloch, 2018). Similarly, Robin (2016) pointed out that the personal narrative that the storytellers tell about their own experiences constitutes the most popular type of digital story. For instance, in the study above by Robin (2016), the teachers who implemented DST in their classrooms found that students' motivation and engagement levels were increased as a result of telling their personal stories. Robin (2016) maintained that the phenomenon supported the idea of the "director's chair effect." By digital storytelling, students had chances to express themselves, which gave rise to their sense of efficacy. In sum, the findings from the previous studies suggest that digital storytelling, when utilized appropriately, can serve as a dynamic teaching and learning method that brings about academic gains, language development, digital literacy development, and a sense of efficacy in students.

Nevertheless, the contributing effects of DST on digital literacy identified by the previous studies (Karakoyuna & Kuzub, 2013; Thang et al., 2014;) are mostly derived from a single survey and/or self-appraisal by the participants. Besides, the questionnaire used by the previous study did not break down the construct of digital literacy into its sub-domains. To mend this gap and respond to the call by Belcher (2017) for further research on exploring the trajectory among the affordances of multimodality of digital storytelling, digital literacy, and L2 writing pedagogy, the current study employed both quantitative and qualitative methods to shed more light on this juncture.

## Method

### Design

This research utilized a case-study approach (Richards, 2003) to provide both quantitative and qualitative data of a group of Taiwanese university students engaged in year-long digital storytelling, which was integrated as part of their L2 writing practices. According to Duff (2014), a case study is suitable when understanding individuals' experiences and development courses within a particular educational context is the goal. This case study is exploratory in nature with an attempt to gain insight into the potential effects of DST on developing L2 learners' digital literacy and self-efficacy. The researcher functioned as an instructor of the course and a participant observer in the physical class and the cyber space. Most students entered this class with a good grasp of computer literacy and above-average communication competence in English. The study lasted for the entire school year from the fall semester of

2017 to the spring semester of 2018. At the onset of the study, the students were introduced to Storybird-mediated writing as an integral component of the course. To tap into the participants' view of Storybird-mediated digital storytelling, qualitative data were also gathered from an open-ended survey and a group interview toward the end of the study.

### **Participants and Setting**

As a result of convenient sampling, eighteen English-major freshmen enrolled in the Composition One course were recruited to take part in this one-year, Storybird-mediated DST project. The average English proficiency of 18 participants was between B1 and B2 based on the Common European Framework of Reference for Languages (CEFR) with one-third of them comfortably landed on B2 while two-thirds remained on B1. Composition One is a required year-long course for every English-major freshman in this 4-year college. The class meets two hours per week in an attempt to cultivate students' ability to write a 5-paragraph academic essay as the ultimate goal. At the beginning of the fall semester in 2017, two tutorial sessions were conducted to orientate the participants to this relatively novel way of composing and writing. In line with the course objectives for each writing practice, the participants were asked to compose and illustrate their first draft on Storybird. The instructor, also the researcher of the current study, commented on the participants' writings via Storybird. When the participants finished their second draft, they would receive voluntary comments from the other EIL students studying at the other university. The partnership was formed via the collaboration with another professor's composition class voluntarily. They were encouraged to visit their partners' Storybird writings and leave comments as well. There were three telecollaborative exchanges among the students.

### **Procedures**

Storybird was a free Web 2.0<sup>1</sup> publishing tool providing collections of artwork for digital stories. It was chosen as a DST platform for this study because it is user friendly and safe cyberspace for creating and writing. Unlike other multimodal platforms, such as Padlet or Photo Story, Storybird allows teachers to conveniently set up accounts for their students and organize them into classes. Using Storybird, the teacher can comment on the students' written assignments and set the deadline for students to submit their revisions. The work students produce can then be shared among the members and peer-assessed. Thus, on top of the instructor's comments, students are able to see and learn from what other students have written. Crucially, it can also be published for the whole world to see, which lends itself nicely to the concept of learning English as a global language with communication as a primary goal.

### **Data Collection and Analysis**

Both quantitative and qualitative data were collected to shed new light on how the participants' digital literacy and self-efficacy were affected as they took part in the Storybird-mediated writing course. This study also tapped into the participants' points of view as to how they perceived this novel way of writing. Two quantitative instruments, the Digital Literacy Scale and the Self-Efficacy of Using English as International Language, were developed by the researcher to gather numerical data on the participants' digital literacy and self-efficacy. The digital literacy scale has four dimensions investigating the participants' information, reproduction/visual, language-based, and connection literacy. These four dimensions were chosen in light of the prior research (Eshet-Alkalai et al., 2004) as well as the educational needs of EIL learners. The self-efficacy questionnaire for EIL learners was developed by referring to

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<sup>1</sup> Storybird is no longer free. Now it charges teachers and students for writing and publishing on the platform.

Bandura's (2006) notion of learner's sense of efficacy to gauge the empowering effects of Storybird-mediated DST on cultivating communication, writing-related, and purpose-driven efficacy. Both instruments have piloted with thirty other first-year college students and obtained satisfactory reliability coefficients of Cronbach's Alphas of .828 and .88 for digital literacy and self-efficacy, respectively. Several paired-samples t-tests were performed to detect any differences in digital literacy and self-efficacy between the pretests and posttests. An open-ended survey and a group interview regarding the participants' view of Storybird-mediated DST were conducted. The survey and interview data were content analyzed to explore emerging themes. To establish the trustworthiness of the qualitative data, the data gathered via qualitative methods were used to triangulate with the quantitative data.

## Results and Discussion

Quantitative data from digital literacy and the self-efficacy questionnaire were analyzed to identify the potential effects of Storybird-mediated DST on participants' digital literacy and self-efficacy as EIL users. In addition to quantitative analysis, qualitative data were collected through the open-ended survey to understand the participants' perceptions of partaking in the Storybird-integrated composition class. In the following sections, three major findings will be presented as tentative answers to the three research questions, accompanied by discussion.

### **Research question 1: Is there any significant difference in university EIL students' self-rated English digital literacy before and after their part-taking in Storybird-mediated digital storytelling?**

There is a significant difference in the participants' overall digital literacy after year-long participation in Storybird-mediated digital storytelling. A questionnaire for self-rated English digital literacy was administered to 18 students twice to detect any changes in their digital literacy before and after the intervention. Cronbach's Alphas of .84 and .89 were obtained for the pretest and the posttest of the digital literacy questionnaire, which suggests the satisfactory reliability coefficient of both tests. Table 1 summarizes the difference in the overall digital literacy, information literacy, reproduction literacy, language-based literacy, and connection literacy between the pretest and the posttest. The participants rated themselves higher in the overall and four sub-categories of digital literacy after year-long engagement in Storybird-mediated digital writing. Among the four sub-categories of digital literacy, the participants made the most substantial gain in reproduction/visual literacy while the least in information literacy.

Table 1: Summary of pretest and posttest of the digital literacy scale

	Pretest		Posttest	
	Mean	SD	Mean	SD
Overall	11.05	1.28	11.77	1.65
I: Information literacy	2.90	0.43	2.97	0.55
II: Reproduction literacy	2.79	0.41	3.13	0.49
III: Language-based literacy	2.54	0.35	2.63	0.44
IV: Connection literacy	2.83	0.48	3.04	0.45

(N=18)

This identified discrepancy between information and reproduction/visual literacy may be attributed to the chosen DST platform and the designated writing tasks. The platform, Storybird, involves choosing artwork to illustrate the participants' writing as the end product, which

ultimately trained the participants' ability to create new interpretations by using pre-existing visual sources. The considerably increased reproduction literacy might also help the participants write better, the effects worthy of investigating in the future study. While writing, it is crucial to be able to reorganize and rearrange pre-existing sentences to produce distinct implications. According to Labbo, Reinking, and McKenna (1998), successful reproduction-literate scholars usually possess excellent synthetical and multi-faceted thinking, which may contribute to more skillful writing. However, as they wrote and selected artworks, the participants were not required to include outside source references as they composed their paragraphs or essays. As a result, the platform and the task did not land themselves to the development of information literacy.

To further identify if there was any significant difference in the overall and sub-categories of digital literacy before and after the intervention, five paired-samples t-tests were carried out. The results are displayed in Table 2. According to the paired-samples t-tests, there are significant differences in the overall and the reproduction/visual literacy between the pretest and the posttest. However, there is no significant difference in information literacy, language-based literacy and connection literacy between the pretest and the posttest.

Table 2: Paired-samples t-test results of a questionnaire of digital literacy

	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Overall (Post-Pre)	0.72	1.10	0.26	2.80	17	.01*
Information literacy (Post-Pre)	0.07	0.41	0.10	0.78	17	0.45
Reproduction literacy (Post-Pre)	0.34	0.45	0.11	3.25	17	.005**
Language-based literacy (Post-Pre)	0.09	0.34	0.08	1.16	17	0.26
Connection literacy (Post-Pre)	0.21	0.43	0.10	2.10	17	0.05

\*P< .05 \*\*P< .01

Different from the researcher's anticipation, there is no significant difference in language-based literacy which the participants were offered ample opportunities to develop. The current results concerning digital literacy are partially consistent with the findings from previous research (Thang, Sim, Mahmud, Lin, & Ismail, 2014; Robin, 2016). Similar to Thang et al. (2014) study, where their participants' digital literacy was improved after creating their group stories on Photo Story 3 for a semester, the present study also saw the enhanced overall digital literacy. Nevertheless, unlike the study above by Thang et al. (2014) in which the participants' language literacy, connection literacy, and media literacy were all enhanced, the current study only found a significant difference in reproduction/visual literacy. As explained earlier, the nature of Storybird and the tasks involved might be the possible reasons to account for the non-significant, pre-post difference in the sub-category of information, language-based, and connection literacy.

The non-significant finding in language-based literacy appears to be in contrast to Robin's (2016) assertion that engaging in multimodal DST facilitates the enhancement of digital storytellers' language literacy, oral ability, and cross-cultural competence. In his study, the participants used audio or other media to compose digital storytelling, and their language

literacy was substantially improved. On the contrary, the current study did not see such a positive outcome in language-based literacy although the 18 participants had written and revised several English paragraphs and essays on Storybird during the two semesters. The plausible reason may include that the digital writing tasks on Storybird did not ask the participants to focus on spotting grammatical errors, paraphrasing or summarizing information and/or deciphering the content of websites. The only item under language-based literacy that has reached significant difference states, “I can identify English information that is not correct.” As the participants composed on Storybird, they had to search for an outside source to back up their writing assignments. This may account for the significant difference identified in this item. Another interesting finding surfaced as the connection literacy was on the brink of reaching a significant difference ( $P = .051$ ). This may be due to the fact that the participants were only provided with limited opportunities to engage in peer sharing/commenting with their partners in the nearby colleges. There were only three times that the participants reviewed and commented on others’ Storybird writings as well as being reviewed and commented on throughout the entire school year. Should the cross-institutional collaboration have lasted longer, the connection literacy might have further developed. In light of the enhanced overall digital literacy, it is also essential to find out if the integration of Storybird has boosted the participants’ sense of confidence in speaking and writing in English as an International Language.

### **Research question 2: How does DST affect participants’ self-efficacy as EIL users after taking part in Storybird-mediated digital storytelling?**

There is no significant difference in the overall self-efficacy of being an EIL user among the 18 participants before and after the intervention; nevertheless, a significant difference was identified in the aspect of writing-related self-efficacy. To investigate the effects of Storybird-mediated DST on self-efficacy, the questionnaire of self-efficacy as EIL user was administered to 18 participants in the beginning and the end of the school year. Table 3 provides a summary of the mean scores and standard deviations of the overall and the three domains in the pre and post self-efficacy scores for 18 participants. Table 2 indicates that the participants’ self-efficacy as EIL user were boosted in their overall and the three domains. The reliabilities of the pretest and posttest were calculated with satisfactory Cronbach’s ( $\alpha = 0.861$  for the pretest and 0.854 for the posttest).

Table 3: Summary of pretest and posttest of self-efficacy as EIL user questionnaire

	Pretest		Posttest	
	Mean	SD	Mean	SD
Overall	7.67	1.00	8.00	1.24
I: Communication	2.67	0.48	2.76	0.51
II: Writing-Related	2.49	0.41	2.64	0.49
III: Purpose-Driven	2.54	0.35	2.63	0.44

(N=18)

Four paired-samples t-tests were performed to examine the effect of Storybird-mediated DST on the participants’ self-efficacy and its three domains before and after the intervention. Table 4 shows that there is no significant difference in overall, communication, and purpose-driven self-efficacy. Nevertheless, a significant difference was identified in writing-related self-efficacy, which suggests that the participants’ writing-related self-efficacy was significantly enhanced at the end of this study ( $t=2.43$ ,  $p<.05$ ,  $d=.54$ ).

Table 4: Paired-samples t-test of pre and post-test of self-efficacy of using English as an international language

	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Overall (Post-Pre)	0.33	0.88	0.21	1.60	17	0.13
Communication (Post-Pre)	0.09	0.35	0.08	1.14	17	0.27
Writing (Post-Pre)	0.15	0.29	0.07	2.28	17	0.04*
Purpose (Post-Pre)	0.08	0.43	0.10	0.83	17	0.42

\*P<.05

Different from the insignificant difference identified with the current participants, Yang and Wu (2012) reported that DST had significant effects on senior high school students' English proficiency, critical thinking, and self-efficacy. Although Yang and Wu focused on high school students' English learning motivation, they did include five items for self-efficacy in their motivation questionnaire. Their research results indicate that the use of DST in the English class positively influenced their students' learning motivation, and their writing self-efficacy, a domain in writing motivation, was significantly improved at the end of the study. For the present study, lack of practice might be the main reason accounting for the non-significant findings with the overall, communication-related, and purpose-driven self-efficacy after year-long engagement in Storybird-mediated digital storytelling. The participants did not get sufficient opportunities to communicate with their cross-institution partners via digital storytelling; neither did they have enough practices to accomplish specific tasks through digital storytelling. As a result, their sense of confidence was not cultivated. Given ample practices, their self-efficacy of using English for communication and purposes might be elevated, as in the case of their writing-related self-efficacy, the primary focus of this study. The statistic findings suggest that self-efficacy in one language skill cannot collude to others unless there are a compatible amount of practices evenly allocated for other language skills.

Unlike the insignificant statistical difference in the participants' overall self-efficacy, the qualitative analysis from the open-ended survey indicates that the majority of the participants considered their sense of confidence being promoted as a result of partaking in the Storybird-mediated digital storytelling. Every participant affirmed the statement that their sense of confidence had been enhanced after year-long writing training. When asked if the integration of Storybird writing has somehow contributed to their enhanced confidence, the majority responded positively, with only 4 out of 16 respondents answering with ambivalence. Many participants attributed the compliments from other Storybird writers as the leading cause for their elevated confidence. For example, Erica recalled, "I have received some compliments on my stories from other writers, which has made me feel more confident in my writing." Similarly, Jessica pointed out that Storybird not only has made English writing more exciting but also removed her apprehension towards it, which in turn increased her confidence in English writing. This finding is consistent with the previous research results (Robin & McNeil, 2012; Sylvester & Greenidge, 2009; Yang & Wu, 2012). Robin & McNeil (2012) postulated that students' self-efficacy was promoted after implementing DST in the classroom. Interestingly, Sylvester and Greenidge (2009) noticed that the students' motivation to write increased after they were informed that their writing assignments would be published on the Internet and viewed by other people other than their teachers, which echoes precisely what some of the participants stated in the survey. For instance, Elaine mentioned, "Somehow, I feel more motivated and confident to write when I knew that some real readers are out there on the Storybird to read and appreciate

my writing,” as she contemplated on her overall experience with Storybird. When the EIL students have the opportunity to publish their written work on the Internet and receive genuine comments afterward, their sense of confidence in English writing can be fostered.

### **Research question 3: What are the participants’ perceptions of integrating Storybird into their L2 writing class?**

Storybird-mediated DST was well-received as an integral part of their composition class by the participants. Analyses of the responses from the end-of-year survey indicate the overwhelmingly positive reaction to the integration of Storybird among the present participants. The survey consists of 16 questions probing into the participants’ views on integrating Storybird-mediated DST into their regular composition class, commenting/receiving comments from other Storybird writers, and operating on the Storybird platform. Three major themes are presented and illustrated with the participants’ responses, including preferring Storybird-integrated over conventional writing classes, benefiting from the interaction with other Storybird writers, and wanting some modifications on the Storybird platform.

When asked to choose between the Storybird-integrated and the traditional composition class, the entire cohort except for one student opted for the former for several reasons. The foremost reason identified by the participants is that Storybird makes English writing more exciting and less inhibiting when compared with the conventional writing class. The participants not only enjoyed writing on Storybird but also benefited from interacting with other Storybird writers. Emily pointed out, “It’s delightful to write on Storybird with so many pictures to choose from. My writing became more interesting and vivid after being illustrated with pictures”. Many participants mentioned that receiving feedback from people other than the instructor also makes the writing process worthwhile because having a real audience brings purpose and meaning to the writing. Most participants found the comments they received helpful in revising their piece of written work. For instance, Vicky recalled the comments she got from the other Storybird writer and asserted that “I have never thought my story could be developed that way until I saw the suggestion from the other Storybird writer. It’s always beneficial to have an additional read to give my writing a fresh look”. Besides receiving helpful comments from others, the participants enjoy reading others’ Storybird writings as well. With the considerable advantages stemming from the Storybird integration, the majority of the participants recommended the continuous use of Storybird for next year’s students. Nevertheless, when asked if they would continue to use Storybird as a writing platform after the current class ended, only 4 participants said “Yes” while the rest replied with uncertainty.

Most participants acclaimed the vivid and artistic pictures offered by Storybird as the primary feature that instilled fun into the writing process. Teresa mentioned, “I really enjoy illustrating my story with the Storybird pictures. This process helped me relax and become less concerned about my imperfect English”.

Many other participants also acknowledged that when they write on Storybird, they pay more attention to the content instead of the grammatical accuracy of their English compositions. For example, Alisa mentioned that “While I am writing on Storybird, I pay less attention to grammatical accuracy and vocabulary usage; instead, I focus on my contents. On the contrary, when I am writing with the other way, I will pay more attention to them. I think the difference is that for me, my works in Storybird are like stories; however, when they are in a traditional way, they are essays.” In addition to the eye-catching pictures provided on the Storybird platform, many participants applauded the opportunity to interact with other Storybird writers via reading and commenting on each other’s stories. When asked what they mostly focused on

while commenting on others' Storybird writing, fourteen out of the 18 participants said that they mainly focused on the content, two on the language accuracy, and the remaining two on the structure. They believe that the content is the core of any story and deserves the most attention. Therefore, when the participants commented on others' Storybird writing, they usually thought of themselves as a reader and a language learner. The participants voiced their preference for constructive comments advising how they can revise their stories. Emily explained, "With this kind of comment, I would know what to do with my story. As for those comments with only compliments, I welcome them, but I think I learn little from them". Although the participants held very positive views of Storybird, they identified some limitations of this platform, such as no flexibility of mixing illustrations from various artists, no spelling checker, the difficulty of locating matching pictures, and difficulty of modifying the story. The participants would like to see some of the aforementioned problems being addressed with the updated version of Storybird.

The main reasons accounting for the participants' positive attitudes toward the Storybird-integrated digital writing are similar to the previous study (Dogan, 2012; Hett, 2012) where the subjects enjoyed writing with the artistic pictures and interacting with their peers. Hett (2012) postulated that the technologically enhanced images and audio made DST captivating for young writers. Although Storybird is not equipped with audio recording, the participants in the current study were drawn enchantedly to writing a story with pictures. In addition, most participants believe that they have made substantial progress in English writing as a result of taking part in this project, which echoes Yoon's (2013) argument that DST can improve students' language growth in reading, writing, speaking and listening. In sum, integrating Storybird into a conventional composition course has been perceived as a motivating, stimulating, interactive, and facilitating innovation by the current participants who fervently suggested the continued use of the platform for the upcoming freshman class.

### **Pedagogical Implications and Conclusion**

The overall findings of this study suggest that DST can be a practical and empowering pedagogical addition to the existing EIL writing course. Different from the previous studies which relied on a single survey result to report the potential effects of DST on cultivating digital literacy (Karakoyuna & Kuzub, 2013; Thang et al., 2014), this study pointed out the differing outcomes among sub-categories of digital literacy. The differing outcomes suggest that merely integrating a technologically advanced approach will not automatically develop all aspects of digital literacy. The type of digital literacy mainly cultivated hinges upon the nature of the adopted platform and the characteristics of instructional task design. Explicit instructions on verifying the source reliability and identifying the media bias are needed to cultivate students' information literacy. With the unprecedented overflow and preoccupation of social media among youth, cultivating their information and connection literacy became far more crucial than before. To help adult EIL students become prudent consumer of social media rather than being consumed by social media, the English language teachers ought to educate their students about how to "use technology as a tool to engage in creative, productive, lifelong learning rather than simply consuming passive content" (Thomas, 2016, p. 18). This study offers some guidelines for EIL teachers to integrate multimodal DST as an empowering pedagogy.

The quantitative results suggest that integrating Storybird with the conventional EIL writing course has positive effects on cultivating adult EIL students' digital literacy and promoting their writing-related self-efficacy. The current participants not only rated their overall digital literacy but also reproduction/visual literacy higher after their year-long engagement in

Storybird writing. Higher reproduction/visual literacy is often associated with proficient synthetical and multi-faceted thinking (Labbo et al., 1998), two essential prerequisites to skillful writing. In other words, the current participants' writing might also have improved. For future study, it will be of significance to investigate whether this engaging in DST will also help EIL students improve their academic writing. Besides higher digital literacy, the participants also developed a stronger sense of self-efficacy as an EIL writer, which in turn will help them conquer more challenging writing tasks in the future. The boosted self-efficacy in writing suggests that confidence cultivated in one language skill cannot transfer onto other skills. In other words, when EIL students became more confident in one language skill (e.g., writing) via specific training, the influence of the training would not get carried over into other language skills (e.g., speaking, listening or reading). Therefore, it will be ideal for engaging EIL students in multimodal DST in which they can orally contribute to the digital story. As such, the participants' communication-oriented self-efficacy might be promoted. In the present study, the collaboration was mainly conducted in written form.

Apart from the statistical analysis results, the qualitative findings indicate that Storybird was well received by the cohort of 18 students who have expressed enthusiasm toward writing with artful pictures. Despite some difficulties in locating suitable pictures to illustrate their writing, many participants wanted to write more and practice more on Storybird. DST contains not only traditional literacy but also new literacies as it involves multimedia texts. Students who struggle with traditional literacy may have a stronger motivation and a better grasp of traditional literacy when they create digital stories. Thus, new literacies have the potential to scaffold students' traditional literacy (Sylvester & Greenidge, 2009). In both reading and writing, DST is a new medium for struggling students (Hett, 2012). Interestingly, students' motivation to write increased after they were informed that their writing assignments would be published on the Internet and viewed by other people besides teachers. Therefore, the current study suggests that teachers can use DST to motivate reluctant students and stimulate them to revise and complete writing assignments for a broader audience out there on the Internet. According to Pop (2012), students of higher education are often considered self-efficacious learners. Their self-efficacy on learning is often underestimated. However, students' motivation and engagement are two essential elements for successful learning (Pop, 2012; Yang & Wu, 2012). The current study shows that DST enhanced the students' engagement in English learning and their productivity in English writing. The results of the open-ended survey also affirmed the positive effects of Storybird-mediated DST on digital literacy and self-efficacy among adult EIL students. Despite the overall positive findings, some participants voiced their frustration toward choosing the suitable artworks to illustrate their more complicated pieces of writing. Some expressed their tiredness of finding the right pictures to match their writings over the course of one school year. Based on these negative feedbacks, it is advisable for any teacher who intends to introduce a DST platform to his/her students that sticking to one single platform throughout the entire year may not be the best practice. It's worth trying more than one platform to gauge its instructional affordance and sustainability.

Albeit the theoretical and pedagogical implications, the generalizability of the current study to other L2 contexts is limited in the following aspects. First, the differences identified from the paired-samples t-tests do not denote the interaction among digital storytelling, L2 digital literacy/writing self-efficacy, and time. Second, the number of participants is not significant enough to warrant the predictability of similar outcomes when the study is replicated. Third, the current study did not investigate the effects of DST on L2 writing gains. The development of L2 writing can only be inferred from the participants' self-reported data. In light of the above limitations, the future study may recruit more participants and randomly divide them into the

experimental group with DST and the control group with conventional L2 writing pedagogy to explore the potential differences in digital literacy, self-efficacy, and L2 writing competence. Also, the future study should look into the effects of DST on writing development among L2 learners.

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