Does Digital Storytelling Have an Effect on Writing Outcomes?

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ABSTRACT

Writing has a significant role in students' academic and lifelong learning. Therefore, educators constantly seek novel ways to develop students' writing skills. This study aims to examine the effect of digital storytelling on secondary school students' creative writing skills and writing self-efficacy. The participants were 15 6th grade students in Turkey. The study was carried out using a one-group pretest-posttest model, which is one of the pre-experimental research designs. "Writing Self-Efficacy Scale" and "Creative Writing Evaluation Scale" for secondary school students were used as data collection tools. Following an instruction on how to use Wevideo tool, students created digital stories about given topics once a week, over a month period.The analysis showed that posttest scores for digital storytelling were significantly higher than pretest scores, but no significant difference was found for writing self-efficacy. These results indicated that the digital storytelling procedure applied in this study improved the participants' creative writing skills. However, no significant variation was observed in the writing self-efficacy scores. In light of the study findings, some recommendations and implications were made to practitioners and researchers.

INTRODUCTION

The importance given to the use of instructional technologies in teaching activities has greatly increased in the last few years. The fact that distance education is the only option in some extraordinary situations, such as a pandemic, the existence of the Generation Zin schools, developments in technology, educational philosophy, and paradigm shifts in educational approaches are among the main reasons for a shift towards technology-based distance education. In fact, young people were actively using new technologies in their daily lives, even before educators had yet to find meaningful ways to integrate them in the classroom (Robin, 2008). Although discussions on the effectiveness of instructional technologies continue, the reasons stated above have accelerated developments in the use and integration of instructional technologies in educational settings. Therefore, the transformational process that was expected to take place in educational environments has manifested itself earlier than expected. As a result, "technology" has become a key concept in 21st century educational research, which is receiving great attention in many fields of education, including language teaching, science, mathematics, music, art, and history education. Digital storytelling is one of these teaching technologies that has been studied in recent years.

Digital storytelling, which is a relatively new concept in the literature, refers to the integration of multimedia and storytelling for a wide variety of purposes, such as meeting individuals' communicative and

self-expression needs, facilitating teaching, and improving various skills (Çıralı Sarıca & Koçak Usluel, 2016; Meadows, 2003). In digital storytelling, the user utilizes computer-based tools to tell a story they created based on their personal experiences and imagination. Therefore, a digital story includes the creation of various narratives and stories by blending visual and auditory elements such as text, sound, picture, photograph, and video (Kindborg, 2001). This content is consolidated with a wide range of multimedia components, such as graphics, audio, text, video, and music;, and the final product can be played on a PC or made accessible online (Robin, 2008). The storytelling consisting of a process of pen and paper leaves its place to a more entertaining format in which visual and auditory elements are added. The storytelling process involving pen and paper gives way to a more entertaining format in which visual and auditory elements are added. Digital storytelling provides an opportunity for computer users to exercise their creativity by following traditional methods such as choosing a subject, doing an investigation, writing a screenplay, and creating an interesting story (Robin, 2008). Because of these features, it becomes a process that requires the individual to use a set of different skills. The individual has the opportunity to develop varied skills in creating a digital story. One of these is that digital storytelling practices are thought to develop one's creative writing abilities.

Creativity, which manifests itself in all kinds of human acts from education to industry, from art to culture, and from industry to science (San, 1979; Brockhus, van der Kolk, Koeman & Badke-Schaub, 2014), is accepted as a skill that leads the individual to success in today's society and changing socio-economic conditions. For this reason, it is noteworthy that recent studies have focused on developing the creativity of individuals from an early age in contemporary educational processes (e.g., Brockhus, van der Kolk, Koeman & Schaub, 2014; Ferrari, Cachia & Punie, 2009; Kaplan, 2019; Rawat, Qazi, Hamid, 2012; San, 1979). In this context, one of the areas related to creativity that is emphasized is writing skills (e.g., Barbot, Tan, Randi, Santa-Donato & Grigorenko, 2012; Bozkurt, Aydın, Taşkıran & Koral 2016; Chen & Zhou, 2010; Erdoğan, 2013; Kapar Kuvanç, 2008; Nasir, Naqvi & Bhamani, 2013; Pawliczak, 2015; Temizkan, 2011; Tok & Kandemir, 2015; Türkben, 2019; Ulu, 2019; Vass, 2007). As a matter of fact, writing, which includes a number of cognitive, physical, and psychological factors from planning to sharing, is a performance-based skill that bears the opportunity to reveal the creativity of an individual. In this respect, it is accepted that creative writing practices contribute to the development of creativity-related skills in various subjects, such as creative thinking, designing, and creating original products. In addition, research shows that creative writing contributes to problem solving, identifying problems, rethinking something that was thought about before but could not be finished, and most importantly, developing new ways of thinking (Pawliczak, 2015). Therefore, creative writing can be considered an area that improves both creative skills that prepare individuals for their future careers as well as their thinking and problem-solving skills. The significance of creative writing in fostering the cognitive and communicative skills of students cannot be overstated (Essex, 1996). Tompkins (1982) lists seven reasons why children should write stories. These reasons are as follows: for purposes of entertainment, developing an artistic expression, exploring values and goals of writing, stimulating readers' imaginations, clarifying one's thoughts, searching for an identity, and improving literacy skills. These reasons listed by Tompkins (1982) clearly explain the importance of creative writing. The approach of creative writing offers students the opportunity to express their thoughts and views about the world based on their personal experiences, empowering them to utilize language more creatively and effectively. By encouraging students to take a more active role in writing, this approach represents a valuable alternative to conventional writing activities (Maltepe, 2006). Hence, it is important to develop students' creative writing skills in various ways. However, in the 21st century, in which technology has permeated every aspect of life, creative writing refers not only to books and other printed materials, but also to written and unwritten performances, oral and recorded outputs, and various genres produced in electronic, digital, and other new media (Bennett, Clarke, Motion, & Naidoo, 2008, p. 2). For this purpose, one of the digital environments that can be used to develop individuals' creative writing skills is digital storytelling. Studies in this field suggest that digital storytelling practices have a significant impact on creative writing skills (e.g., Garrard, 2011; Duman & Göçen, 2015; Tsigani & Nikolakopoulou, 2018; Uslu & Uslu, 2021; Yamaç & Ulusoy, 2016). Of course, research does not focus on the effects of digital storytelling on creative writing skills. As a matter of fact, writing skills are affected by many factors, and it is important to focus on these factors for their development. One of these is self-efficacy beliefs, which are considered effective in the process of revealing and developing many academic skills.

Self-efficacy refers to the belief that an individual has in their capacity to perform a certain task or skill in situations that affect their life (Schunk & Meece, 2006; Williams, 2010, p. 418), and is a psychological construct that guides an individual's assessment of their own skills and capacity to perform the necessary operational steps to reach an expected level of success (Schunk, 2011, p. 105). Students with high self-efficacy beliefs make more effort to face difficulties and contend more when they have the necessary skills (Schunk, 2011, p. 107). Therefore, self-efficacy is closely related to learning and success. In this respect, school experiences play an important role in shaping self-efficacy beliefs, which help produce the necessary behaviors and motivations (Sharma & Nasa, 2014; Zimmerman, 1995:204) that are important for demonstrating an effective performance (Schunk & Meece, 2006, p. 79). Factors such as the curriculum, the teacher's ability to manage learning processes and motivate students for learning, and her ability to provide them with social experiences, are effective in developing students' self-efficacy beliefs and making them evaluate their own efficacy (Bandura, 2006, p. 10; Zimmerman, 1995, p. 208). Self-efficacy is also one of the most important factors in transforming behavior. It is an important construct, especially in learning processes involving complex tasks (Delich & Roberts, 2017). Writing is also affected by self-efficacy beliefs, as it involves high-level processing with complex and gradual tasks. The literature indicates that there is a mutual relationship between writing self-efficacy and writing skills, as shown in various studies (Pajares, 2003). For example, Chapman and Tunmer (2003) revealed that students with negative academic self-efficacy beliefs were significantly worse in phonetic sensitivity and writing their names when they started school than students with positive academic self-efficacy beliefs. At the end of the first year of school and in the middle of the third year, these students' reading levels, word recognition levels, and reading comprehension levels in the classroom were found to be lower than the others. For this reason, it is considered important to improve students' self-efficacy beliefs in order to increase their writing performance. In this context, many alternative activities can be used to improve students' writing. As mentioned above, digital storytelling is one of the practices that are considered to increase students' success in writing (Robin, 2008). In this study, it is therefore intended to examine the effects of digital storytelling practices on students' creative writing and writing self-efficacy beliefs. Thus, a perspective and an understanding will be provided to the discussions in the literature by examining the effects of technology on creativity and writing skills, which are claimed to affect the academic and future professional lives of an individual in today's educational environments, where technology gains more importance day by day. In line with these purposes, the questions sought to be answered in the research are as follows:

1. Do digital storytelling practices have a significant effect on writing self-efficacy?

2. Do digital storytelling practices have a significant effect on creative writing skills?

RESEARCH METHOD

Research Model

This study follows a pre-experimental design. Pre-experimental design refers to research methods that do not meet the basic requirements of true-experimental research designs, such as random assignment and equality between groups. It can be implemented in three different ways: one-group pretest-posttest, static group comparisons, and as a one-shot (Berg & Latin, 2004). A one-group pretest-posttest design has certain disadvantages compared with true-experimental designs in terms of internal validity and generalizability of results. Since it is almost impossible to meet the requirements of a true-experimental design in most educational settings, educators and practitioners often opt for quasi-experimental and pre-experimental studies (Blas, 2013). In this study, researchers used a one-group pretest-posttest design as they could not form comparable groups in equal numbers due to voluntary participation, parental consent, and other conditions related to implementation. In accordance with this design, the current research employed a single-group pretest-posttest design, which involved administering a pre-test before the implementation and a post-test after the implementation. The data obtained from the pre- and post-tests were then analyzed by comparison.

The implementation phase of this study was limited to four weeks. Hence, it is of significance that interfering variables that may occur over time other than the independent variable are controlled. In this line, it was aimed to eliminate the possibility of physiological and psychological changes in the students

participating in the study.

In digital storytelling activities, students' readiness levels, the selection of writing tasks, teachers' competences, and technological opportunities provided by the school are among the variables that affect the process. Before starting the implementation, it was ensured that participants were equipped with the skills they needed to have to perform the activities using the given technological tool. The selection of writing tasks was carried out by an expert in the fields of Turkish language education. During the phase of implementation, having competent researchers in the field of both educational technologies and Turkish language education allowed the process to be carried out under appropriate conditions. Lastly, extraneous variables were controlled by having computers with the necessary hardware to perform the implementation in the computer laboratory of the school.

Participants

The participants in this study are 15 sixth-grade secondary school students in Yenimahalle, one of the central districts of Ankara, Turkey. The research group consisted of eight female and seven male students. Among the students chosen by random sampling, those who voluntarily participated in all of the digital storytelling activities and filled the scales completely were included in the study. The random sampling of the students was done by the researchers choosing a determined number of volunteers among the 6th graders who study at the school where the sample is located.

Implementation Process

The research took a total of 7 weeks, including the pre- and post-test. Before the implementation, the "Writing Self-Efficacy Scale" was applied to the students as part of the pre-test. To reveal the participants' creative writing skills, they were asked to create a text based on the topic "A Day in the Past". Prior to starting the actual implementation, the students were instructed on the use of WeVideo, which is a tool that allows students to create digital stories online. Afterwards, a four-week main implementation procedure was carried out, in which a digital story was created every week. The participants were asked to create digital stories with the themes "Summer Vacation" in the first week, "Unlucky Day" in the second week, "Environment" in the third week, and "Our World" in the fourth week. During the implementation, the researchers helped the students solve their problems by answering their questions about the online tools. After four weeks of digital storytelling practices, the "Writing Self-Efficacy Scale" was applied to the students again as part of the post-test, and they were asked to create a text based on the topic "One Day in the Future".

Study Setting

The physical and online environments constitute the study setting where the implementation was carried out. The physical environment of the study is the computer laboratory of a secondary school in the capital city of Turkey. There are fifteen computers with an Internet connection in the laboratory. WeVideo was chosen as the online setting. WeVideo is an application that allows users to create videos that they can edit with images and save in different formats by signing up on its website for free. Being an easy-to-use application was one of the factors in using WeVideo as a digital storytelling tool in the study. In this tool, it is possible to access the most appropriate images for the given content by choosing one of the themes suitable for the creative writing subject. The visual representation of the interface of the online environment is given in Figure 1.
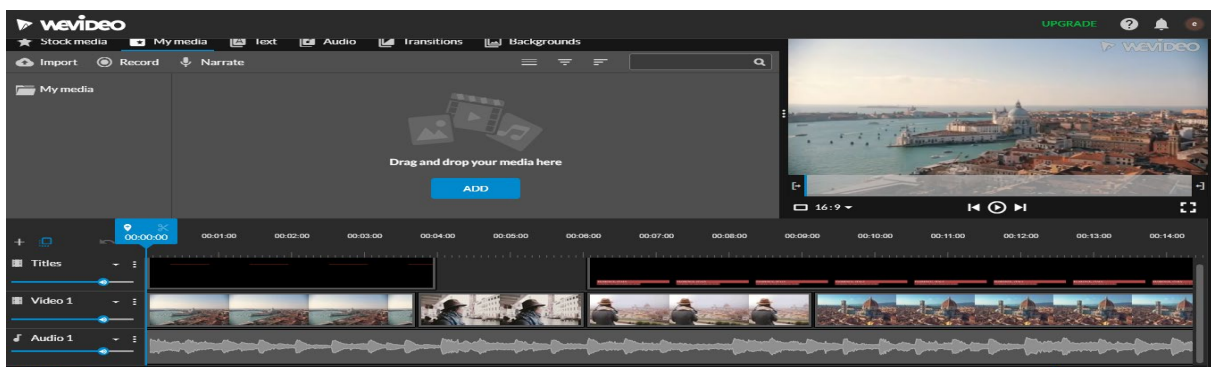

Figure 1. *The online environment interface where the experimental process is performed*

As seen in Figure 1, videos can be prepared by adding files of different media formats with the drag-and-drop method. The fact that the video created during the tasks can be played continuously on the preview window helps to use the allocated time effectively.

Data Collection Tools

In this study, the data collection tools used were the "Writing Self-Efficacy Scale for Secondary School Students" (WSES) created by Şengül (2013) and the "Creative Writing Assessment Scale" (CWES) developed by Ünal and Sever (2012).

Writing a Self-Efficacy Scale for Secondary School Students

The scale was developed by Şengül (2013). In the scale development study, a 45-item draft form was first applied to 293 students studying in 10 different primary schools. The data obtained were evaluated through the factor analysis method. As a result of the analysis, a total of 40 items, 30 of which are positive and 10 of which are negative, were selected for the final form of the scale. The KMO value of the scale was .869, the Bartlett test was found to be 8252.72 and the Cronbach Alpha reliability coefficient was .92. These results show that the scale is a reliable instrument for determining writing self-efficacy. The scale consists of four factors: 1st factor is writing skill awareness, 2nd factor is writing psychology, 3rd factor is personal progress; and 4th factor is overall progress. The scale was designed in a five-point Likert format, with a maximum score of 200 and a minimum score of 40.

Creative Writing Evaluation Scale

The scale developed by Ünal and Sever (2012) is a five-point Likert type,- consisting of a total of 20 items. This scale was prepared by taking into account the principles of creative writing, success criteria in creative writing, and written expression evaluation forms. The first version of the scale was presented for the expert opinion. Then, the deficiencies identified by the experts were remedied, and the scale was given its final form. The highest score in the instrument was determined to be ten in order to facilitate the analysis of the implementation results and increase the clarity of their interpretation.

Since both of the scales used in the study were developed in accordance with the participants' age group and mother tongue, no further adaptation was deemed necessary.

Data Analysis

The data collected from the WSES and CWES were examined using SPSS. Since the number of participants was fewer than 30, nonparametric methods were utilized to examine disparities between the scores prior to and following the experimental procedure. To carry out this analysis, the Wilcoxon Signed Rank Test was utilized. In order to perform the Wilcoxon test on related measurements, the dependent variable could be an ordinal scale, and the pairs of observations must be independent of each other (Büyüköztürk, 2005).

Since the scales used in the research are Likert types, the ordinal scale assumption is met. Furthermore, since the two observations were made at two different times, before and after the implementation, the pairs of observations are independent of each other. These show that the necessary assumptions are met for the Wilcoxon test for related measurements.

FINDINGS

Findings on Students' Writing Self-Efficacy

In this section, the first research question of the study, "Is there a significant difference between the pre-test and post-test WSE scores of the experimental group in which writing activities were carried out with digital storytelling?" is analyzed. For this purpose, first of all, the mean, standard deviation, and range values of the participants in the experimental group are given in Table 1.

Table 1. *Mean, Standard Deviation, and Range Values for the Writing Self-Efficacy Scale*

	PRE-TEST				POST-TEST			
	N	X̄	S	R	N	X̄	S	R
Experiment	15	80.20	8.13	31.00	15	85.20	8.34	26.00

According to Table 1, while the pre-test WSE score average of the students who participated in creative writing activities through digital storytelling was 80.20, this value became 85.20 after the experiment. Accordingly, an increase is observed in the average scores of the students participating in the experimental implementation. The Wilcoxon Signed Ranks Test, which was conducted to reveal whether the changes observed in the WSE scores before and after the experimental procedure is statistically meaningful, can be seen in Table 2.

Table 2. *Wilcoxon Signed-Rank Test Results of Writing Self-Efficacy Scores Before and After the Experiment*

Posttest-Pretest	n	Mean Rank	Sum of Rank	z	p
Negative Rank	4	5.75	23	-1.85	.064
Positive Rank	10	8.20	82		
Equal	0				

According to Table 2, there is no significant difference between the writing self-efficacy scores of the students before and after the experiment. These results show that the digital storytelling practice did not have a significant effect on improving the participants' writing self-efficacy.

Findings Related to Students' Creative Writing Levels

In this section, the second research question, "Is there a significant difference between the pretest and posttest CWAS scores of the experimental group in which the writing activities were carried out with the digital storytelling implementation?" is analyzed. In doing so, first of all, the mean, standard deviation, and range values of the participants in the experimental group are given in Table 3.

Table 3. *Distribution of Creative Writing Rating Scale's Mean, Standard Deviation and Range Values*

	PRE-TEST				POST-TEST			
	N	X̄	S	R	N	X̄	S	R
Experiment	15	4.38	.35	1.28	15	4.58	.40	1.58

According to Table 3, while the average score of the students participating in creative writing activities with digital storytelling was 4.38 before the experiment, this value became 4.58 after the experiment. Accordingly, an increase is observed in the average score of the students participating in the experimental implementation. The Wilcoxon Signed Ranks Test, which was conducted to reveal whether the changes observed in the CWAS scores before and after the experimental procedure are statistically meaningful, showed a significant difference, and its results can be seen in Table 4.

Table 4. *Wilcoxon Signed-Rank Test Results of CWAS Scores Before and After the Experiment*

Posttest-Pretest	n	Mean Rank	Sum of Rank	z	p
Negative Rank	4	6.00	24	-2.046	.041
Positive Rank	10	8.73	96		
Equal	0				

As Table 4 indicates, as a result of the experimental implementation, it was found that there was a significant difference in the creative writing ranks of the students (z=-2.05, p<.05). Considering the mean ranks and the sums of difference, it is revealed that this difference is in favor of the post-test scores. In line

with these findings, it can be said that the experimental implementation had an important effect on improving the participants' creative writing skills.

DISCUSSION AND CONCLUSION

The search for the use of technological tools in learning environments for successful and effective language teaching has been continuing for many years (Hava, 2019). Writing is one of the language skills that attracts many researchers' attention in terms of the use of technological tools for its development and has been the subject of research with differing scopes (e.g., Baki, 2019; Bozkurt, Aydın, Taşkıran & Koral 2016; Garrard, 2011; Uslu & Uslu, 2021). The present study is one of the studies conducted for this purpose, and the results show that digital storytelling practices have a significant effect on the creative writing skills of secondary school students but not on their writing self-efficacy. When the related literature is examined, digital storytelling is seen to be effective on academic success in the areas of information and communication technologies (Gömleksiz & Pullu, 2017), social studies (Demirer, 2013), science (Hung, Hwang & Huang., 2012; Bilen, Hoştut, & Büyükcengiz, 2019), physics (Kahraman, 2013), Turkish (Özerbaş & Öztürk, 2017) and English language competence (Yang & Wu, 2012). These mentioned studies focus on the effect of digital storytelling implementations on academic success, especially in ongoing classes or courses. In the present study, however, such a purpose was not necessarily pursued, and the focus was placed only on writing, which is one of the four basic language skills, expressing a more specific area in the Turkish language courses. Although there are some studies in the literature showing the effects of digital storytelling implementations on academic success and self-efficacy, it is seen that the studies on the effects on writing skills and self-efficacy are limited and mostly aimed at pre-service teachers. It is hoped that the findings of the current study will fill this gap in the literature.

When the related literature is examined, it is suggested in some studies (Foley, 2013; Göçen, 2014; Demir & Kılıçkıran, 2018) that digital storytelling practices are effective on students' writing skills, as also confirmed in the current research.Baki (2019), who conducted a detailed study on this subject, examined the effects of digital storytelling on the development of Turkish teacher candidates' creative writing skills. According to the results of this research, the participants showed improvement in terms of "originality of ideas, fluency of thoughts, the flexibility of thoughts, vocabulary, sentence structure, organization, writing style, and grammar" after their training on digital stories. The fact that digital storytelling practices are essentially writing-based activities may be the most important reason for this. Moreover, in addition to the diversity of emotions, experiences, methods, and techniques, the use of instructional technologies may have affected self-efficacy beliefs, which are a motivational factor providing motivation towards creative writing (Küçük, 2007).

The Turkish Language Curriculum has several key objectives, including fostering research skills, encouraging exploration and interpretation, and facilitating the construction of knowledge. Additionally, the curriculum aims to enhance students' ability to access, utilize, and generate information from printed and multimedia resources, while also promoting critical analysis of multimedia content (MoNE, 2015). Since elements such as photographs and videos are used in digital storytelling activities, the use of audiovisual elements by the student is ensured. In this case, besides being exposed to these stimuli, the student's use of these can help learning become more permanent.

Bartscher et al. (2001) state that in creative writing activities, students focus more on the writing process. Hence, the digital storytelling method used in this study may have helped students focus more on the act of writing.

It is known that the essence of creative writing skills is to create a fictional world. According to Orhon (2019), in the creation of fiction, which is an important type of creative writing, characters, events, places, sub-events, perspectives, and dialogues are elaborated. Each of these stages includes certain procedures that need to be established with respect to the type of fiction. The digital storytelling tool used in the current research, which included the necessary elements for students to create fiction, fulfilled its role in the participants' expected levels of development.

One of the factors contributing to the students' improvement in creative writing after the digital storytelling practice may be attributed to the fact that digital technologies support active participation. In the digital storytelling activity, the student has to interact with many elements in the environment. Moreover, enriching their expressions within an interactive environment surrounded by many different visual stimuli can help students express their emotions more easily. The rich stimuli can encourage students to produce various ideas in terms of the creative writing process and let them produce an authentic outcome via various audio-visual elements. The fact that students constantly have rich experiences throughout the practices may have supported the gradual development observed in their writing skills. As a matter of fact, writing is a skill that develops with experience. In particular, augmenting this process with interesting experiences such as technology that appeals to multiple senses is a factor that can positively affect writing performance. This point of view also constitutes the reason underlying the current research. Therefore, these views lend support to the second research question of this study.

Within the scope of the study, it was found that the participants' writing self-efficacy was not significantly affected by the digital storytelling activities. The most important reason for this finding may be that the development of self-efficacy perception usually requires a relatively long process and greater experience (Bandura, 1986). Therefore, when it comes to variables such as attitude and self-efficacy that indicate affective development, it is quite possible not to observe a significant change.

If we need to evaluate the quantitative findings of the study in general, it can be said that the results are parallel to each other. In other words, digital storytelling practices can be said to contribute to both affective and cognitive growth. This is because the students' post-test scores of their writing self-efficacy and success were found to be higher than their pre-test scores. However, while the change in writing self-efficacy beliefs was not statistically significant, the change in creative writing was significant. Arıcı and Dölek (2020) examined the extent to which these two variables affect each other. In their findings, they found a weak, linear, and statistically significant positive relationship between students' general writing success and their writing self-efficacy beliefs. This finding also supports the results of the current study. In fact, it is possible that both variables may not increase at the same level in the same student group.

Suggestions

- Teachers can utilize digital storytelling to improve the writing success of their students who have problems with the writing process.

- Further studies can be carried out with larger sample groups.

- Digital storytelling implementation can be examined in the context of teaching students with low perceptions of their writing self-efficacy.

- The effectiveness of the implementation in different courses and for different learning outcomes can be investigated.

- To expand upon the current findings, it may be valuable to conduct similar studies with students of various grade levels and age groups.

- Qualitative studies can be conducted to reveal students' views on the implementation.

- Since the course of affective benefits may take time, longitudinal studies can be conducted to determine the development of self-efficacy.

- Implementations can be made regarding the use of a digital storytelling approach in the courses offered to Turkish language teacher candidates in higher education.

- The effects of a digital storytelling approach on foreign language writing skills can be investigated.

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