



OPEN ACCESS

EURASIA Journal of Mathematics Science and Technology Education
ISSN: 1305-8223 (online) 1305-8215 (print)
2017 13(10):6807-6822
DOI: 10.12973/ejmste/78032



The Use of Digital Storytelling in Nursing Education, Case of Turkey: Web 2.0 Practice

Zeynep Tatli

Karadeniz Technical University, Fatih Faculty of Education, Trabzon, TURKEY

Ebru Turan-Güntepe

Giresun University, Faculty of Education, Giresun, TURKEY

Cigdem Gamze Ozkan

Karadeniz Technical University, Faculty of Health Sciences, Trabzon, TURKEY

Yeter Kurt

Karadeniz Technical University, Faculty of Health Sciences, Trabzon, TURKEY

Esra Caylak-Altun

Karadeniz Technical University, Faculty of Health Sciences, Trabzon, TURKEY

Received 9 April 2017 • Revised 6 August 2017 • Accepted 16 September 2017

ABSTRACT

The aim of the study was to evaluate the effects of nurse candidates' digital storytelling boards and hand-drawn storytelling boards (the current method) on processes of empathising with patients and analysing the case. The study designed in mixed research model was conducted with the 1st year nursing students in Turkey. While the experimental group used web 2.0 tools to prepare their storytelling boards, the control group used paper and pencil to prepare their storytelling boards. Storytelling boards designed by the students were analysed under the titles of empathising with patients and analysing cases and opinions of the nurse candidates about the process were assessed. The experimental group analysed cases more easily and tried to see the incidences from the others' eyes more compared to the control group. Besides, this process was an interesting and enjoyable one. Digital storytelling would be an alternative and effective teaching method for nursing education.

Keywords: digital storytelling, nursing education, empathy

INTRODUCTION

For centuries, individuals have effectively narrated their experiences to the other side through storytelling supported by appropriate statements and gestural expressions (Gere, Kozlovich & Kelin, 2002). Events experienced by people, their perceptions and their thinking ways are inserted, interpreted, and concluded in storytelling from their own point of views (Yiğit, 2007). Today, storytelling is named as digital storytelling as result of being shaped by digital technology and the combined use of multimedia components such as visuals, sounds, and musical effects in computer environment (Mellon, 1999; Robin, 2006; Lambert, 2013).

Teaching process given by conventional patterns has fallen short of meeting needs and expectations of today's learners (Prensky, 2001). While learning process is prepared, it is important to acquire key skills of 21st

© **Authors.** Terms and conditions of Creative Commons Attribution 4.0 International (CC BY 4.0) apply.

Correspondence: Zeynep Tatli, *KTU Fatih Faculty of Education Computer Education and Instructional Technologies Dept. 61335 Sogutlu Akcaabat Trabzon, Turkey.*

✉ zeynepktu@hotmail.com

Contribution of this paper to the literature

- Since development of storyboards by using web 2.0 tools in digital stories facilitate users to focus on process instead of product, it can give a different direction to future studies.
- Digital stories can bring individuals empathic skills required for effective communication or increase these levels. Additionally, opinions about the process can be taken in a healthier way. Thanks to these aspects, the study is thought to likely make contribution to different studies in the literature.
- Digital stories may contribute to studies aiming to bring skills of looking at events from a different perspective, critical thinking and problem solving, which are important indicators of scientific approach or develop these skills.

century such as critical thinking, problem-solving, taking responsibility, creative thinking, digital literacy, collaboration, and communication (ISTE, 2016). It is necessary to use effective and interesting teaching methods, which are alternative to traditional teaching methods, support meaningful learning, and address the changing characteristics of learning (Bromberg, Techatassanasoontorn, & Andrade, 2013). Herein, digital storytelling allows to form a student-centred and technology-enriched learning environment for learners (Barrett, 2006). Digital storytelling provides learners with an opportunity to narrate their own personal experiences and to develop emotional communication skills with the help of storytelling (Dörner, Grimm, & Abawi, 2002). Besides, it is known that digital storytelling, which enhances creativity, imagination, and motivation of learners (Duveskog, Tedre, Sedano, & Sutinen, 2012; Nicoletta Di & Paolo, 2013), improves their writing, critical thinking, and literacy skills (Xu, Park, & Baek, 2011), increases their knowledge, contributes to academic achievements, and enhances problem solving skills and creativity (Hung, Hwang, & Huang, 2012; Yang & Wu, 2012), is an entertaining method (Rossiter & Garcia, 2010; Mutalib, Aziz, & Shaffiei, 2011; Suwardy, Pan, & Seow, 2013; Karakoyun, 2014).

It is significant for learners to share their learning experiences by facing the past and thus designing their future in order to make contributions to their learning achievements (Burgess, 2006; Merritt, 2006; Guajardo et al., 2011; Cushing & Love, 2013). During this process, digital storytelling helps students to correct their behaviours and to develop the feeling of empathy, which enables them perceive the world from others' eyes (Neal, 2001; Kieler, 2010; Sawyer & Willis, 2011; Iseke, 2011; Hess, 2012). Additionally, learners reflect their life experiences, opinions, and emotions with digital storytelling (Brushwood Rose, 2009; Sanchez-Laws, 2010; Kearney, 2011; Condy, Chigona, Gachago, & Ivala, 2012) on the other hand, they analyse their own opinions and behaviours (Hull and Katz, 2009) and interpret matters from different point of views (Reed & Hill, 2010; Sawyer & Willis, 2011).

When literature is reviewed in terms of designing an effective digital storytelling, it is seen that although there are similar definitions concerning functioning of digital storytelling, there are differences in its phases (Tatli, 2016). In this sense, Jakes and Brannon (Jakes & Brennan, 2005) specify these phases as writing the script, scenario, storyboard, locating multi-media, structuring digital storytelling, and sharing. Schuck and Kearney (Schuck & Kearney, 2008) summarize these phases as capturing pedagogical frame and developing the idea, structuring story board, arranging storyboard, preparing the video, video-recording, arranging the video, presentation of the video to a small group, presentation of the video to general audience/classroom, and dissemination.

Nursing is a health discipline that requires theoretical knowledge and clinical practice skills. Basic objective of nursing education is to bring nurse candidates a professional view, to prepare them for professional life in the future, and to raise qualified and conscious nurses who are aware of their responsibilities and duties towards their country, comprehend importance of health protection and promotion, and are able to answer the existing health problems (Bektas, 2004; Orgun, Ozkutuk, & Temel, 2007; Kumcagiz et al., 2009; Celikkalp, Aydin, & Temel, 2010). Behaviours aimed to be acquired by nursing students in line with teaching process are closely associated with quality of nursing care to be provided to individuals and the community. Since nursing is a profession that requires to acquire cognitive, psycho-motor, and attitudinal behaviours, it is crucial to use innovative practices and methods in education (Goris, Bilgi, & Korkut Bayindir, 2013).

Considering that nurse candidates are likely exposed to negative circumstances such as withdrawal, professional alienation, and feeling of inadequacy when they have a problem with patients or their significant others during education process, it is thought that they can overcome these negative circumstances through empathy or by gaining empathic skills. It may be asserted that students can modify learning styles and methods by producing new understandings that will support formation of their professional identity through generation of meanings, emotional participation, and reflection by involving digital storytelling in the nursing education; and as a result, this modification in learning styles is also quite effective on promoting learning and developing patient-centred practices (Christiansen, 2011), increasing students' self-esteem, improving critical thinking ability, providing ethical and cultural awareness, and designing communication techniques (Davidhizar & Lonser, 2003).

Therefore, we are of the opinion that digital storytelling in nursing education will make contributions to literature, improve patient care skills and provide students to analyse situations with a different point of view. The aim of the present study was to evaluate the effect of nurse candidates' digital storytelling boards and hand-drawn storytelling boards (the current method) on processes of empathising with patients and analysing the case.

MATERIALS AND METHODS

Study Design

The study was designed in the mixed research design integrating strengths of qualitative and quantitative data (Johnson & Christensen, 2004; Johnson & Onwuegbuzie, 2004; McMillan & Schumacher, 2010; Tashakkori & Teddlie, 2010). In the present study, the explanatory design -in which researchers collect and analyse quantitative data and then collect and analyse qualitative data in order to define these data- was preferred (Creswell & Tashakkori, 2007).

Study Group

The study was conducted with 1st-year nursing students who studied at Nursing School of a public university located in the Province of Trabzon in Turkey. In the study, a class was randomly assigned to the experimental group (25 female students and 5 male students, n= 30) and the other class was assigned to control group (23 female students and 7 male students, n=30). Both groups presented the duties through digital storytelling but while preparing storyboards in this process, the experimental group used the Web 2.0 applications and the control group used the hand-drawing technique. At the end of the process, digital storytelling was designed and the students' opinions were discussed and reviewed. While presenting the qualitative data, the students in the control group were coded as C1, C2, ..., C30; whereas, the students in the experimental group were coded as E1, E2, ..., E30.

Implementation Phase of the Study

During the study, nurse candidates' -firstly- were given training on improvement of digital storytelling and then two duties were assigned to them: empathising with patients and analysing cases. Nurse candidates in the experimental group were taken to a computer laboratory. The students were seated in such a way that one computer was allocated for each student and storytelling boards were described by one expert. Each of the nursing students in the control group was seated in a separate desk (in order to prevent the students' effect on each other) and received a blank A4 paper and a pencil. At this phase, steps of digital storytelling designed by Jakes and Brannon (2005) were used. These steps were -in order- writing, script, storyboarding, locating multimedia, structuring digital story, and sharing. In the writing process -which was the first step-; the same patient story was distributed to the nurse candidates and then both groups were asked to write a scenario about this patient story. The experimental group was asked to design digital storytelling boards; whereas, the control group was asked to draw storytelling boards by hand. Afterwards, both groups incorporated sound and music effects into their storytelling boards designed in line with their scenarios, transformed them into digital storytelling, and shared. In last phase of the study; the nurse candidates were asked to assess the process through questionnaires and rubrics

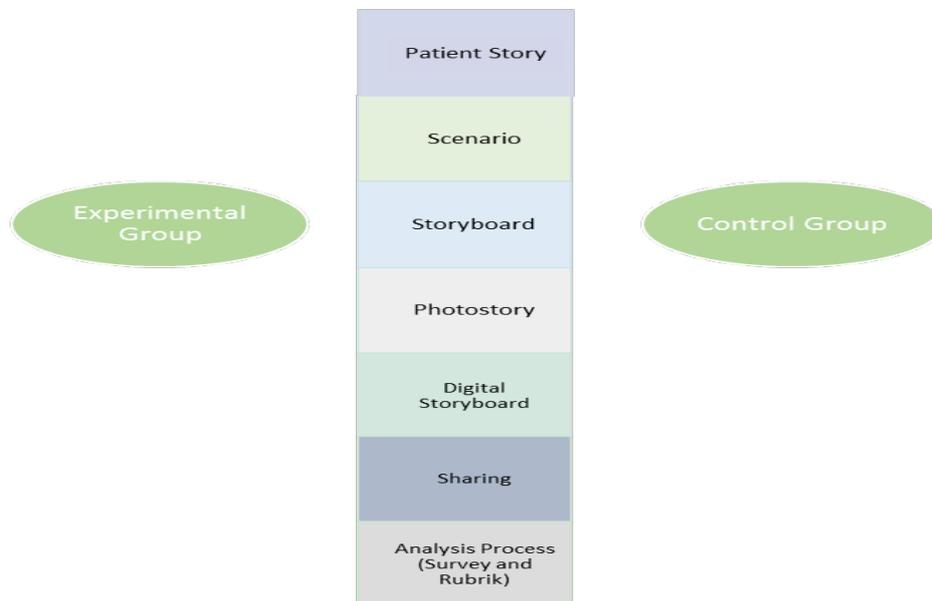


Figure 1. The implementation phase executed by the nurse candidates



Figure 2. Screen shots of digital storytelling boards designed by the experimental group

developed by the researchers. **Figure 1** shows the implementation phase for the nurse candidates in the experimental and control groups.

While **Figure 2** shows screen shots of digital storytelling boards created by the experimental group, **Figure 3** shows screen shots of hand-drawn boards created by the control group.

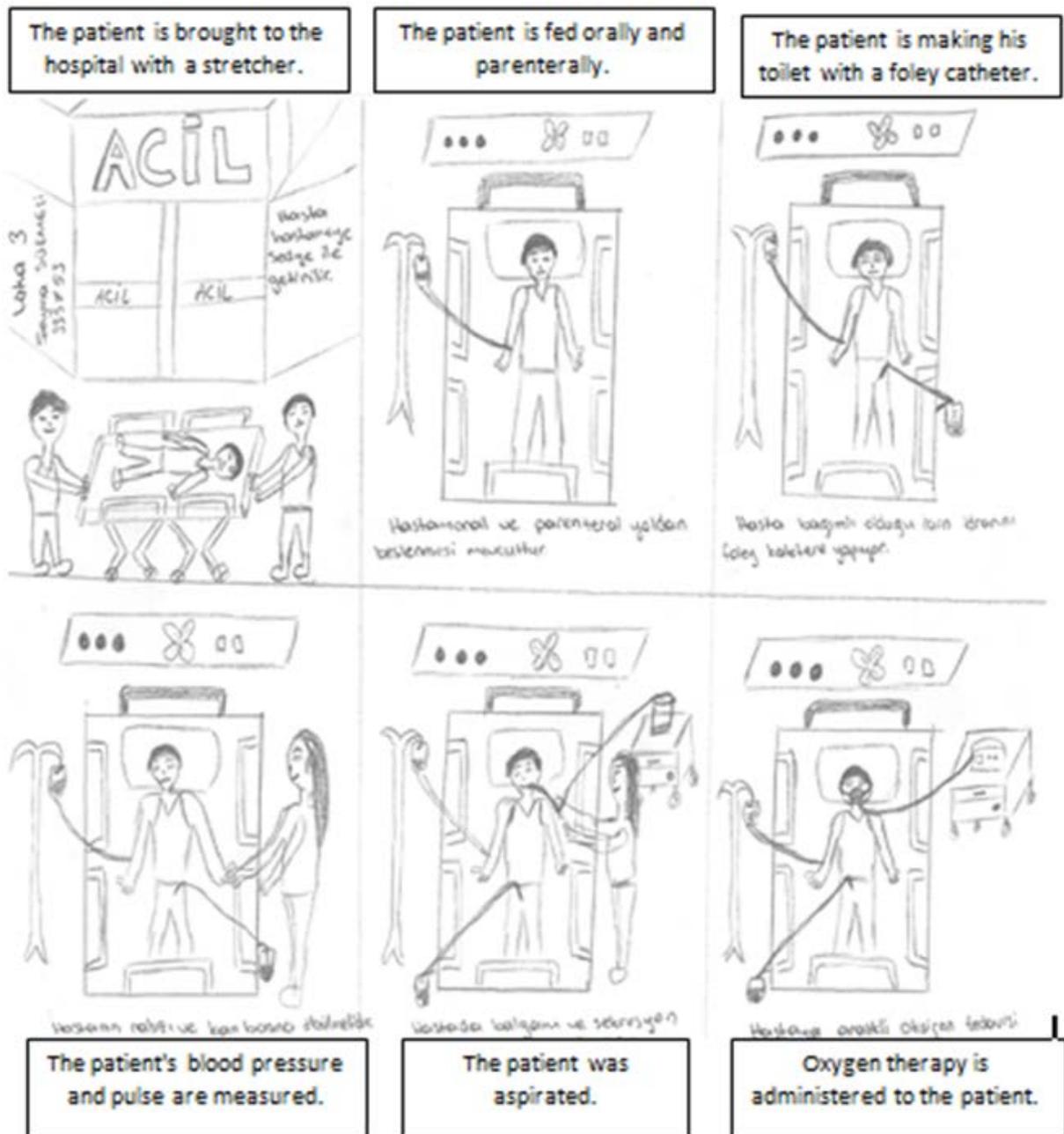


Figure 3. Screen shots of hand-drawn storyboards by the control group

Data Collection Techniques and Tools

Storyboards that were designed through digital storytelling by the nurse candidates in the experimental and control groups were analysed under the titles of empathising with patients and analysing cases. Besides, the opinions of the nurse candidates were taken by using semi-structured questionnaires. The questionnaire included 15 questions; 4 of these questions addressed socio-demographic characteristics of the participants and the other questions addressed digital storytelling in the experimental group and the hand-drawn storyboards in the control group. Additionally, a rubric that assessed patients' physical characteristics, emotional characteristics,

Table 1. Storyboard Rubric

Criteria	1	2	3	4
Patients' physical characteristics	Extremely incomplete (0-1 characteristic is depicted.)	Partly incomplete (2-3 characteristics are depicted.)	Partly satisfactory (4-5 characteristics are depicted.)	Satisfactory (≥ 6 characteristics are depicted.) <ul style="list-style-type: none"> • Old age status • Obese/ • Patient position • Loss of strength • Care need • Short of breath • Exercising • Others ...
Patients' emotional characteristics	Extremely incomplete (0-1 characteristic is depicted.)	Partly incomplete (2-3 characteristics are depicted.)	Partly satisfactory (4-5 characteristics are depicted.)	Satisfactory (≥ 6 characteristics are depicted.) <ul style="list-style-type: none"> • Verbal expression of joint pain • Pain in facial expression • Expression of fatigue (verbal) • Expression of fatigue • Not doing exercises • Unwillingness • Being unhappy • Others
Communication	No communication	Partly poor (0-1 characteristic is depicted.)	Partly satisfactory (2 characteristics are depicted.)	Satisfactory (≥3 characteristics are depicted.) <ul style="list-style-type: none"> • Speech bubbles • Facial expression • Use of body language • Others ...
Facial expressions of patients	No expression (No expressions of characters are depicted.)	Partly poor (One expression is in each box.)	Partly satisfactory (2 expressions are depicted in each box.)	Satisfactory (There are ≥ 2 expressions in each box.) <ul style="list-style-type: none"> • Painful • Helpless • Tearful • Compelled • Happy • Angry • Others ...
consistency of story with each storytelling board	No consistency of story with each storytelling board	Poor consistency of story with each storytelling board	Partly satisfactory consistency of story with each storytelling board	Satisfactory consistency of story with each storytelling board
Setting properties	Extremely incomplete (0-1 property is depicted.)	Partly incomplete (2-3 properties are depicted.)	Partly satisfactory (4-5 properties are depicted.)	Satisfactory (≥ 6 properties are depicted.) <ul style="list-style-type: none"> • Bed • Wheel-chair / chair • Shelf • Vital signs • Patient board • Patient safety/ asterisk • Serum • Walking cane /walker • IV-serum • Room number • Name of the clinic • Tray • Others ...
The stage - story consistency	Inconsistent stage and story board	Poor stage and story (1 or 2 properties are depicted.)	The stage and story are fine but not well-organized.	The stage and story are fine and well-organized.

communication, facial expressions, consistency of story with each storytelling board, properties of the setting, and stage-story consistency was used in order to evaluate works done by both groups. Each subtheme in the rubric was scored between 1 and 4 (min. 1, max. 4 points). Total score was calculated out of 100 by summing the scores of 7 subthemes. **Table 1** shows the rubric.

Data Analyses

The quantitative data were assessed by using SPSS 22.0 packaged software and the results were analysed by using means, frequency, and Mann-Whitney U test. Since histogram and normal Q-Q plots indicated that the data did not show a normal distribution, it was found out that it was appropriate to employ non-parametric tests (Buyukozturk, Cokluk-Bokeoglu, & Koklu, 2015). The qualitative data were analysed by using content method because texts were arranged, classified, and compared and theoretical assumptions were drawn (Cohen, Manion, & Morrison, 2007). Once the data were arranged, data reduction was performed and codes were formed. Afterwards, themes were drawn from these codes constructed and code and theme tables were created.

Mixed studies should be analysed both quantitatively and qualitatively in order to achieve reliability and validity (Creswell & Tashakkori, 2007). Similarly, Johnson and Christen (2004) assesses this process as cyclical, recursive, and interactional. Strategies such as credibility (internal validity), transferability (external validity), dependability (internal reliability), and conformability (external reliability) should be taken into consideration for achieving reliability and validity (Yildirim & Simsek, 2011). Different data collection techniques and research approaches were employed together in the present study in order to achieve validity and reliability and the researchers were in contact with the participants and avoided subjectivity in order to present the actual situation. Additionally, the data collected were analysed at a different time and the findings, codes, and themes were tested by the researchers. In the test, the percentage of agreement was found as 95% by using Miles & Huberman's (1994) percentage of agreement formula:

$$\text{Number of agreement} / \text{number of disagreement} * 100$$

In addition, intervention, data collection process, participants, and data collection tools were compatible.

RESULTS

The data obtained from the study by using questionnaires and rubrics included nurse candidates' processes of empathising with patients, analysing cases, and their experiences at the end of the process.

Figure 4 shows number of boards of the nurse candidates, characters in the scripts, and comparison of nursing diagnoses.

It was observed that the number of boards designed by using Web 2.0 tool increased up to 8 boards in the experimental group. However, most of the students in the control group (86.66%) limited their story with 3 boards. Also, when the characters in the boards were examined, it was determined that while 46.66% of the experimental group used 4-5 characters, 24.16% of the control group used 4-5 characters. 53.33% of the nurse candidates in the experimental group established at least ≥ 3 diagnoses; whereas, 90% of the nurse candidates in the control group established ≤ 2 diagnoses.

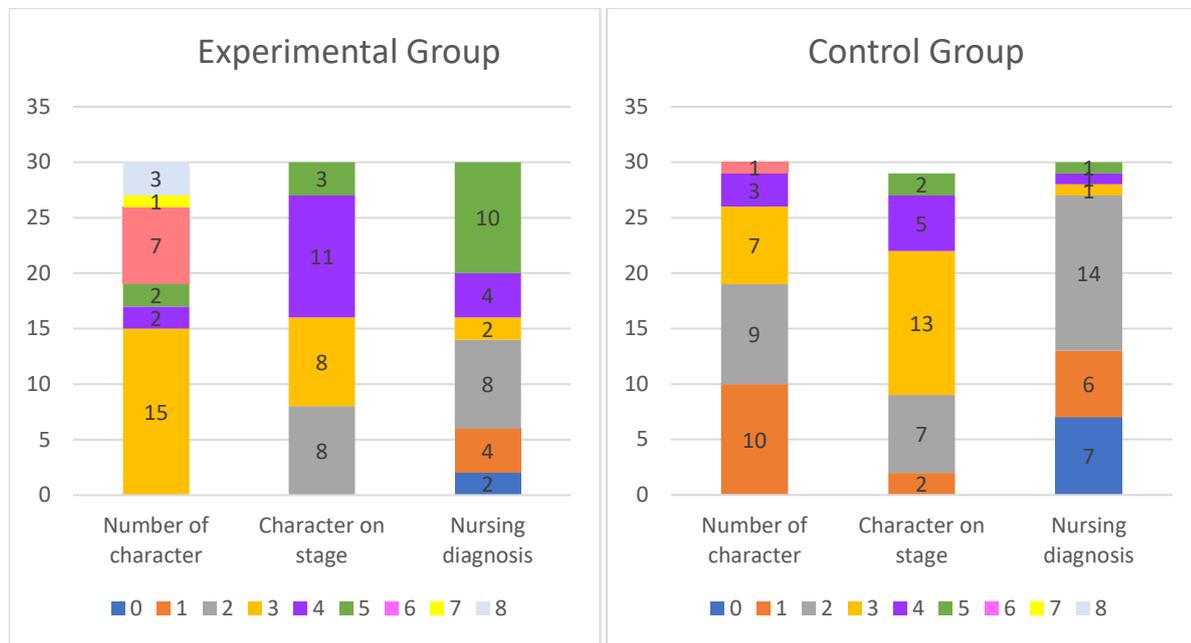


Figure 4. Number of boards, characters in the scripts, and comparison of nursing diagnoses

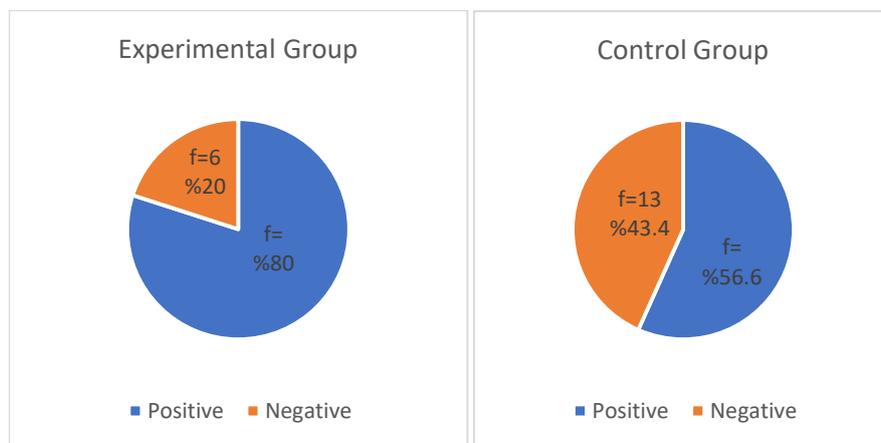


Figure 5. Comparison of the point of views of the nurse candidates about cases

When the nurse candidates' storyboards were investigated, it was found that the point of views of the experimental group (80%) about the cases were more positive compared to the control group (56.6%) (Figure 5).

Persons with whom the nurse candidates in the experimental group communicated about the cases were spouses, nurses, doctors, children, and neighbours; whereas, the control group limited their storytelling with spouses, children, and neighbours. In other words, it was found that the experimental group reflected more different point of views upon their storytelling but negative situations and events depicted in their storytelling process were communicated more positively. One of the study findings indicated that the nurse candidates tried to understand how the circumstance/event was perceived by patients' or their significant others' eye and how doctors or other nurses felt and thought against a negative situation (Figure 6).

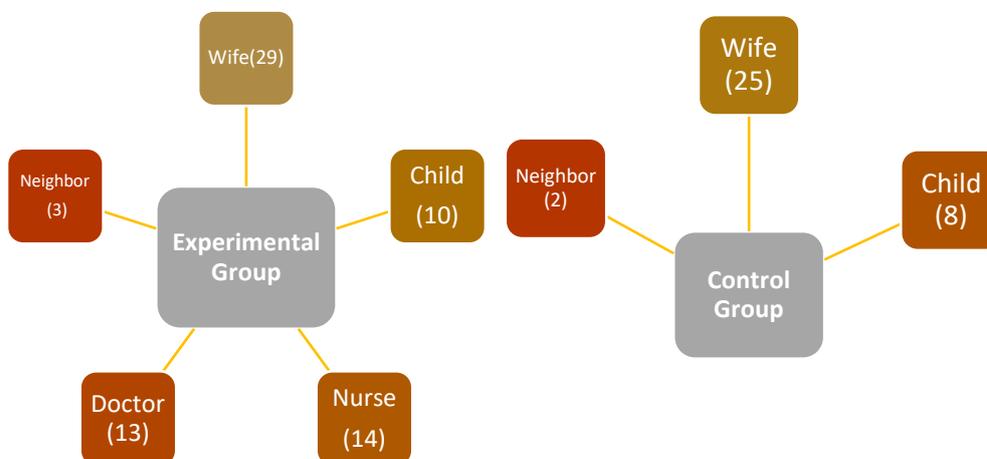


Figure 6. The person with whom the nurse candidates communicated about the cases

Table 2. Rubric Mean Scores and Their Comparisons

RUBRIC ITEMS	Experimental Group (n: 30)			Control Group (n: 30)			Mann-Whitney U Test
	Mean±SD	Median	Mean rank	Mean±SD	Median	Mean rank	
Patients' physical characteristics	2.73 ± 0.944	2.00	37.86	1.89±1.030	2.00	23.13	U: 229.000 p: 0.001
Patients' emotional characteristics	2.96± 0.850	3.00	40.75	1.75±0.844	2.00	20.25	U: 142.500 p: 0.000
Communication	3.63±0.490	4.00	40.33	2.60 ±0.916	3.00	20.67	U: 155.000 p: 0.000
Facial expressions of patients	3.26± 0.691	3.00	36.90	2.57 ±0.920	3.00	24.10	U: 258.000 p: 0.002
Consistency of story with each storytelling board	2.63± 0.850	2.00	30.85	2.53±0.637	2.50	30.15	U: 439.500 p: 0.863
Setting properties	3.03± 1.09	4.00	38.22	2.00±0.942	2.00	22.78	U: 218.500 p: 0.000
The stage and story consistency	3.33± 0.802	3.50	39.03	2.57 ±0.503	3.00	21.97	U: 194.000 p: 0.000
Rubric total score	77.13±13.512	73.20	41.45	56.88±13.638	57.136	19.55	U: 121.500 p: 0.000

The storytelling boards designed by the nurse candidates in the experimental and control groups were examined in terms of “patients’ physical characteristics, emotional characteristics, communication, facial expressions, consistency of story with each storytelling board, and properties of the setting and stage-story consistency” in Table 2.

When the nurse candidates’ case assessments in the rubric were reviewed based on items, it was found that the nurse candidates in the experimental group had higher mean scores than nurse candidates in the control group. Besides, although the nurse candidates in the experimental group had higher mean scores in consistency of story with each storytelling board, no statistically significant difference was found between the experimental group and the control group (p>0.05). In all other subthemes, the comparison of experimental and control groups revealed a statistically significant difference and the difference was caused by the nurse candidates in the experimental group

Table 3. Nurse candidates' digital storytelling process and its reflections

Themes and Codes		Frequency	Percentages	Samples from the answers given
Theme 1. Digital storytelling education program				
Process	Entertaining	22	73.33	E4: "Story designed using this method made the process more entertaining."
	Interesting	20	68.96	E6: "The ready characters and objects used in the process were interesting during creating of digital storytelling."
	Hard	2	6.89	E29: "I had difficulty in creating the story and I was unable to place the objects as I wanted."
	Boring	2	6.89	E18: "Although I was doing willingly at first, it became quite boring later on."
	Easy	1	3.44	E8: "Drawings made with digital stories were a useful and easy method so that the process could correctly be reflected."
Theme 2. Process of learning with digital storytelling				
Achievements	Empathy	26	86.66	E16: "Since I wrote the story from patients' views, I became able to understand them better."
	Understanding cases more easily	23	76.66	E2: "It helped me to understand events/cases more effectively and in a shorter time."
	Improving imagination	10	33.33	E17: "During the draft phase, the method enriched and developed our imagination."
	Enhancing retention of knowledge	5	17.24	E24: "For me, the more pictures there were the more retention of knowledge occurred. Therefore, this technique was highly effective in learning educational materials."
	Noticing deficiencies in the use of technology	3	10.34	E27: "I noticed my incompetency in the use of technology."
	A new learning method	3	10.34	E1: "I have learnt that there are different methods in learning process and as a result, my point of view has changed."
	Enhancing analysis skills	2	6.89	E20: "Analyses made by using technology made me diagnose more easily."
	Strengthening of knowledge	1	3.44	E5: "It was a good method in terms of strengthening the existing knowledge."

($p < 0.05$). When total scale scores of experimental and control groups were compared, it was determined that the nurse candidates in the experimental group had higher scores (77.13 ± 13.512) than those in the control group (56.88 ± 13.638) and the difference between them was significant ($p < 0.05$). These results pointed out that the nurse candidates in the experimental group focused on physical and emotional characteristics of the patients more during the case analysis, analysed the cases by consulting more healthcare professionals, and reflected patients' mood upon their stories more compared to the nurse candidates in the control group. Moreover, it was found in the digital storytelling on case analysis that the nurse candidates in the experimental group paid more attention to properties of the setting and were able to fictionalise stage-story consistency more easily.

Table 3 shows the opinions of the nurse candidates in the experimental group about digital storytelling application

When educational process of the nurse candidates about digital storytelling was examined, most of them described this educational process as entertaining (73.33%) and interesting (68.96%). The candidate E6 told that

Table 4. Nurse candidates' hand-drawing process and its reflections

Themes and Codes		Frequency	Percentages	Samples from the answers given	
Theme 1. Hand-drawing education/training					
Process	Hard	Drawing characters Colouring objects	25	83.33	C ₂₅ : "We had difficulty during hand drawing since we did not have the ability to draw by hand."
	Interesting		8	27.58	C ₁₁ : "It was interesting to learn the course by using a different method."
	Boring		8	27.58	C ₈ : "Depicting the cases by hand-drawing was time-consuming and boring for diagnosis."
	Inability to express things in mind		4	13.79	C ₁ : "Even though I could not express many things by drawing, I drew some certain images in mind."
	Entertaining		2	6.89	C ₇ : "I think it is an entertaining application."
Theme 2. Process of learning through hand-drawing					
Achievements	Understanding cases more easily		11	36.66	C ₅ : "I found the cases in the texts more easily."
	Improving imagination		9	31.03	C ₂₇ : "It did not change me, even if I did not draw the cases, they were in my mind; it did not create any effect in my imagination."
	Empathy		4	13.79	C ₂₂ : "It has changed my views about patients, I have dealt with patients holistically."
	Visual meaning		4	13.79	C ₂₁ : "By drawing, I have understood what and how it is better and found better solutions."
	Inability to express objects		4	13.79	C ₂₈ : "Since my hand-drawing was bad, I could not depict things in my mind, reflect my ideas and opinions, and express myself."

"The ready characters and the objects used in the process were interesting during creating of digital storytelling.". E₄ told that "Story designed using this method made the process funnier." On the other hand; only a few of the candidates (6.89%) considered the process as difficult and boring. Actually, E₂₉ expressed her inability about computer proficiency saying that "I had difficulty in creating the story and I was unable to place the objects as I wanted.". E₁₈ told that "Although I was doing willingly at first, it became quite boring later on." Also, only one of the nurse candidates (3.44%) emphasised that educational process was easy. In this sense, E₈ told that "Drawings made with digital stories were a useful and easy method so that the process could correctly be reflected."

When the nurse candidates' process of learning with digital storytelling was examined, the majority of the candidates (86.66%) stated that it improved their empathic skills and helped them understand cases more easily (76.66%). In this regard, E₁₆ told that "Since I wrote the story from patients' views, this enabled to understand them better." E₂ told that "It helped me to understand events/cases more effectively and in a shorter time." 33.33% of the candidates emphasised that process of learning through digital storytelling improved their imagination. In this regard, E₁₇ stated that "During the draft phase, the method enriched and developed our imagination." Also, 17.24% of the candidates expressed that this method increased retention of the knowledge and E₂₄ emphasised the learning process through digital storytelling by saying that "more retention of knowledge occurred with more pictures for me; therefore, this technique was highly effective in learning educational materials." 10.34% of the candidates expressed that learning through digital storytelling was a new method and thus noticed the deficiencies in the use of technology. One of these students - E₁ - told that "I have learnt that there are different methods in learning process and as a result, my point of view has changed." And E₂₇ indicated that "I realized my incompetency in the use of technology." In addition, it was found out that learning through digital storytelling enhanced analysis skills more (6.89%) and was effective upon overlearning of knowledge (3.44%). One of these candidates - E₂₀ - emphasised that "Analyses made by using technology made me diagnose more easily." Also, E₅ told that "It was a good method in terms of strengthening the existing knowledge."

When the process of hand-drawn storyboards by the nurse candidates in the control group was examined, 83.33% of the nurse candidates told that they had difficulty in drawing characters and objects. C₂₅ explained that *"We had difficulty during hand drawing since we did not have the ability to draw by hand."* Yet, 27.58% of the candidates told that hand-drawing was interesting. The nurse candidate -C₁₁- told that *"It was remarkable to teach the course using a different method"*. However, 27.58% of the candidates told that hand-drawing was boring. In this sense, C₈ expressed that *"Depicting the cases by hand-drawing was time-consuming and boring for diagnosis."* Similarly, they told that hand-drawing (13.79%) was a boring method to express things in mind. In this regard, C₁ said that *"Even though I could not express many things by drawing, I drew some certain images in mind."* 6.89% of the nurse candidates stated that hand-drawing was amusing. C₇ stated that *"I think it is an amusing practice."*

When the process of learning through hand-drawing of the nurse candidates was examined, some of them (36.66%) emphasised that it was effective upon understanding the case more easily. One of these candidates -C₅- told that *"I found the cases in the texts more easily."* However, 31.03% of the candidates pointed out that this technique was not effective in terms of improving imagination. In this regard, C₂₇ told that *"It did not change me. Even if I did not draw the cases, they were in my mind so it did not create any effect in my imagination."* 13.79% of the nurse candidates stated that hand-drawing was effective upon empathy and visual interpretation process. C₂₂ told that *"It has changed my views about patients, I have dealt with patients holistically."* and C₂₁ explained that *"By drawing, I have understood what and how it is better and found better solutions."* 13.79% of the candidates told that they were unable to express their ideas, opinions and feelings by hand-drawing. C₂₈ told that *"Since my hand-drawing was bad, I could not depict things in my mind, reflect my ideas and opinions and express myself."*

DISCUSSION AND CONCLUSION

In the present study reviewing the processes of empathising with patients and analysing the cases through storyboards designed by the nurse candidates using Web 2.0 and traditional methods during the development of digital storytelling, it was determined that the experimental group assessed the cases by using more scenes and characters in their storytelling through Web 2.0 applications. Additionally, it was concluded that the nurse candidates who designed storyboards using Web 2.0 made more nursing diagnoses compared to those who designed the storyboard by hand-drawing; which revealed that the nurse candidates defined the cases more clearly. Therefore, it was thought that digital storytelling boarding technique was prepared more easily than hand-drawing, offered more options and users focused on cases rather than details during the process. In the literature it is reported that Web 2.0 tools introduce diversity in applications in classroom environment and offer an easy and effective learning setting for users through multi-media components such as pictures/photos, videos, and sounds (Nichols, Berliner, & Noddings, 2007; Rossiter & Garcia, 2010).

It was found that the experimental group dealt with cases more positively and from more different point of views and communicated with more people during the storytelling process compared to the control group. It was considered that the use of Web 2.0 tool was associated with the fact that the experimental group examined the cases positively. Through this easy-to-use application the nurse candidates designed storyboards using more characters and tried to reflect the negative situations with point of views of others. In this regard, it was observed that the convenience and customization of Web 2.0 tools used in designing storyboards allowed to close the gap particularly in e-learning environment and helped to empathize by giving an opportunity to establish a comfortable and significant relationship (Tatum, 2009). It was important for candidates to design and communicate stories from the eyes of others in terms of improving their empathic skills. Similarly, Bran (2010) stated that the use of digital storytelling boards in education helped learners to discover and make relations with outside world. As a result, it may be expressed that storytelling boards designed by users using their own sounds/voices by means of digital storytelling boards can improve empathic skills.

It was considered that in the case analysis, the nurse candidates in the experimental group, who designed digital storytelling, internalised the cases more. The nurse candidates who designed digital storytelling were asserted to reveal patients' physical characteristics and environmental properties and even their emotional characteristics and facial expressions more easily. Eroglu (2013) stated that our words, voice tone, and body

language were effective upon expressing what we have understood to the recipient. In this sense, it was considered that the nurse candidates were able to think like patients and speak on their behalf –that is, the nurse candidates evaluated conditions and situations from patients’ and their relatives’ eyes and empathised more easily. It may be asserted that the nurse candidates in the control group had more difficulties in designing the storyboards by hand than the nurse candidates who designed digital storyboards. This may be associated with the fact hand-drawing is related to ability of individual but it was also remarkable that design of digital storytelling through Web 2.0 technology caused a significant difference compared to hand-drawing method. It was thought that nurse candidates who drew by hand had difficulties in describing and displaying patients. Thus, it was observed that the nurse candidates in the experimental group had higher level of awareness and empathic skills in nursing care. Accordingly, negative situations such as withdrawal, professional estrangement, and feeling of inadequacy which can be experienced by the nurse candidates when they had a problem with patients or their relatives can be prevented by empathizing and acquiring emphatic skills.

It was identified that the majority of the nurse candidates found the use of digital storytelling boards in learning process as entertaining and interesting, developed their empathic skills and analysed the cases more easily. In this regard, Robin (2006) pointed out that digital storytelling was interesting for students with different learning styles. Yakinci, Almis and Kavruk (2012) stated that health education is a difficult and demanding process and information supposed to be learnt in this process are easily forgotten but the use of teaching techniques like digital storytelling may eliminate this disadvantage by making learning process entertaining. This may be associated with the fact that digital storytelling boards provide learners with interactive venues and offer them an opportunity to design their own storytelling. Unlike digital storytelling boards; the nurse candidates who designed storytelling by hand-drawing had difficulty in drawing characters and colouring objects. It may be asserted that through opportunities offered by digital storytelling board programs, the candidates drew their dreams and made necessary changes on them more easily. Besides, it is known that the nurse candidates analyse the cases more easily through digital storytelling boards. Learners who use digital storytelling board techniques reach, produce, search, discover, question, criticise, analyse, and synthesise information (Turkmen & Unver, 2012). Therefore, it could be asserted that with this technique, the candidates comprehended clearly the information taught during the process and reflected it upon their stories.

RECOMMENDATIONS

In the light of the study results; the following recommendations were made:

- The use of digital storytelling boards in learning setting may make the information to be acquired more entertaining and interesting. Since this process gives learners an opportunity to involve in story, their empathic skills may be improved. Thus, it is recommended to use digital storytelling boards in teaching of different disciplines.
- It is known that case analyses in nursing education are important. The present study revealed that case analyses with digital storytelling were more effective. Thus, it is recommended to use digital storytelling boards especially for case analyses in nursing education.
- There are many different storyboard applications provided by Web 2.0. Although the students in the experimental and control groups agreed with the necessity to use digital storytelling, the students in the control group complained its difficulty. However, the students in the experimental group did not complain because they designed storytelling boards by using Web 2.0 tool. In the future studies; it may be recommended for researchers to design storyboards with Web 2.0 tool and conduct studies that will compare different Web 2.0 tools.

ACKNOWLEDGEMENTS

We thank the nursing students who participated in the study.

REFERENCES

- Barrett, H. (2006). Researching and evaluating digital storytelling as a deep learning tool. *Technology and Teacher Education Annual*, 1, 647.
- Bektas, A. (2004). Difficulties of nursing students in theoretical and practical education and expectations from the teaching staff. *Nursing Forum*, 5(5), 45-54.
- Bran, R. (2010). Message in a bottle telling stories in a digital world. *Procedia - Social and Behavioral Sciences*, 2(2), 1790-1793. <http://dx.doi.org/10.1016/j.sbspro.2010.03.986>
- Bromberg, N. R., Techatassanasoontorn, A. A., & Andrade, A. D. (2013). Engaging students: Digital storytelling in information systems learning. *Pacific Asia Journal of the Association for Information Systems*, 5(1).
- Brushwood Rose, C. (2009). The (Im)possibilities of self representation: Exploring the limits of storytelling in the digital stories of women and girls. *Changing English*, 16(2), 211-220. doi:10.1080/13586840902863194
- Burgess, J. (2006). Hearing ordinary voices: Cultural studies, vernacular creativity and digital storytelling. *Continuum*, 20(2), 201-214. doi:10.1080/10304310600641737
- Buyukozturk, S., Cokluk-Bokeoglu, O., & Koklu, N. (2015). *Statistics for Social Sciences*. Pegem A Publishing.
- Celikkalp, U., Aydin, A., & Temel, M. (2010). The views of students in the nursing department of a high school regarding to the education received. *e-Journal of Nursing Science & Art*, 3(2), 3-14.
- Christiansen, A. (2011). Storytelling and professional learning: A phenomenographic study of students' experience of patient digital stories in nurse education. *Nurse Education Today*, 31(3), 289-293. <http://dx.doi.org/10.1016/j.nedt.2010.10.006>
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education*: Taylor & Francis.
- Condy, J., Chigona, A., Gachago, D., & Ivala, E. (2012). Pre-service students' perceptions and experiences of digital storytelling in diverse classrooms. *TOJET: The Turkish Online Journal of Educational Technology*, 11(3).
- Creswell, J. W., & Tashakkori, A. (2007). *Editorial: Differing perspectives on mixed methods research*. Los Angeles, CA: Sage Publications.
- Cushing, D. F., & Love, E. W. (2013). Developing cultural responsiveness in environmental design students through digital storytelling and photovoice. *Journal of Learning Design*, 6(3), 63-74.
- Davidhizar, R., & Lonser, G. (2003). Storytelling as a teaching technique. *Nurse Educator*, 28(5), 217-221.
- Dorner, R., Grimm, P., & Abawi, D. F. (2002). Synergies between interactive training simulations and digital storytelling: A component-based framework. *Computers & Graphics*, 26(1), 45-55. [http://dx.doi.org/10.1016/S0097-8493\(01\)00177-7](http://dx.doi.org/10.1016/S0097-8493(01)00177-7)
- Duveskog, M., Tedre, M., Sedano, C. I., & Sutinen, E. (2012). Life planning by digital storytelling in a primary school in rural Tanzania. *Educational Technology & Society*, 15(4), 225-237.
- Eroglu, E. (2013). Effective communication and correct understanding. In E. Eroglu & H. Yuksel (Eds.), *Effective communication techniques*. Eskisehir: Anadolu University.
- Gere, J., Kozlovich, B., & Kelin, D. A. (2002). *By Word of Mouth: A Storytelling Guide for the Classroom*. Honolulu, HI: Pacific Resources for Education and Learning.
- Goris, S., Bilgi, N., & Korkut Bayindir, S. (2013). Use of simulation in nursing education. *Journal of Duzce University Health Sciences Institute*, 4(2), 25-29.
- Guajardo, M., Oliver, J. A., Rodríguez, G., Valadez, M. M., Cantú, Y., & Guajardo, F. (2011). Reframing the praxis of school leadership preparation through digital storytelling. *Journal of Research on Leadership Education*, 6(5), 145-161. doi:10.1177/194277511100600504
- Hess, M. (2012). Mirror neurons, the development of empathy, and digital story telling. *Religious Education*, 107(4), 401-414. doi:10.1080/00344087.2012.699412
- Hung, C.-M., Hwang, G.-J., & Huang, I. (2012). A project-based digital storytelling approach for improving students' learning motivation, problem-solving competence and learning achievement. *Educational Technology & Society*, 15(4), 368-379.
- Iseke, J. M. (2011). Indigenous digital storytelling in video: Witnessing with Alma Desjarlais. *Equity & Excellence in Education*, 44(3), 311-329. doi:10.1080/10665684.2011.591685

- ISTE. (2016). *The National Educational Technology Standards for Students*. Retrieved from <https://www.iste.org/standards/standards/for-students-2016>
- Jakes, D. S., & Brennan, J. (2005). Capturing stories, capturing lives: An introduction to digital storytelling. Retrieved January 16. Retrieved from http://www.jakesonline.org/dstory_ice.pdf
- Johnson, B., & Christensen, L. B. (2004). *Educational Research: Quantitative, Qualitative, and Mixed Approaches*. Allyn and Bacon.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14-26.
- Karakoyun, F. (2014). *Examining the views of elementary school students and preservice teachers about digital storytelling activities in online environment* (Doctoral dissertation), Anadolu University Educational Sciences Institute, Eskişehir.
- Kearney, M. (2011). A learning design for student-generated digital storytelling. *Learning, Media and Technology*, 36(2), 169-188. doi:10.1080/17439884.2011.553623
- Kieler, L. (2010). A reflection: Trials in using digital storytelling effectively with the gifted. *Gifted Child Today*, 33(3), 48-52.
- Kumcagiz, H., Koyuncu, S., Aydin, Yilmaz, A., Uzun, A., & Gunestas, I. (2009). *The Determination of Problems Seen in the Theoretical Lessons and Practical Applications of the Students in Nursing Department of Samsun Higher School of Health*. Samsun: Journal of Experimental and Clinical Medicine.
- Lambert, J. (2013). *Digital Storytelling: Capturing Lives, Creating Community*. Routledge.
- McMillan, J. H., & Schumacher, S. (2010). *Research in Education: Evidence-Based Inquiry*. Pearson Higher Ed.
- Mellon, C. A. (1999). Digital storytelling: Effective learning through the Internet. *Educational Technology*, 39(2), 46-50.
- Merritt, S. (2006). Digital storytelling: Time, identity and morality in multimedia personal narratives of college writing students. *International Journal of Learning*, 13(8), 21-36.
- Mutalib, A. A., Aziz, N., & Shaffie, Z. A. (2011). Digital storytelling makes reading fun and entertaining. *International Journal of Computer Applications*, 18(1), 20-26.
- Neal, L. (2001). Storytelling at a distance. *HCI International 2001*.
- Nichols, S. L., Berliner, D. C., & Noddings, N. (2007). *Collateral Damage: How High-Stakes Testing Corrupts America's Schools*. Harvard Education Press.
- Nicoletta Di, B., & Paolo, P. (2013). Beyond the school's boundaries: PoliCultura, a large-scale digital storytelling initiative. *Journal of Educational Technology & Society*, 16(1), 15-27.
- Orgun, F., Ozkutuk, N., & Temel, A. (2007). The opinions and proposal related to the teaching system of the nurse students. *Journal of Ege University Nursing Faculty*, 23(1), 89-102.
- Prensky, M. (2001). Digital natives, digital immigrants Part 1. *On the Horizon*, 9(5), 1-6. doi:10.1108/10748120110424816
- Reed, A., & Hill, A. (2010). "Don't keep it to yourself!": Digital storytelling with South African youth. *International Journal of Media, Technology and Lifelong Learning*, 6(2), 268-279.
- Robin, B. (2006). *The Educational Uses of Digital Storytelling*. Paper presented at the Society for Information Technology & Teacher Education International Conference 2006, Orlando, Florida, USA. <https://www.learntechlib.org/p/22129>
- Rossiter, M., & Garcia, P. A. (2010). Digital storytelling: A new player on the narrative field. *New Directions for Adult and Continuing Education*, 2010(126), 37-48. doi:10.1002/ace.370
- Sanchez-Laws, A. L. a. l. i. u. n. (2010). Digital storytelling as an emerging documentary form. *Seminar.Net: Media, Technology & Life-Long Learning*, 6(3), 359-366.
- Sawyer, C. B., & Willis, J. M. (2011). Introducing digital storytelling to influence the behavior of children and adolescents. *Journal of Creativity in Mental Health*, 6(4), 274-283. doi:10.1080/15401383.2011.630308
- Schuck, S., & Kearney, M. (2008). Classroom-based use of two educational technologies: A socio-cultural perspective. *Contemporary Issues in Technology and Teacher Education*, 8(4), 394-406.

- Suwardy, T., Pan, G., & Seow, P.-S. (2013). Using digital storytelling to engage student learning. *Accounting Education*, 22(2), 109-124. doi:10.1080/09639284.2012.748505
- Tashakkori, A., & Teddlie, C. (2010). *SAGE Handbook of Mixed Methods in Social & Behavioral Research*. SAGE Publications.
- Tatli, Z. (2016). Digital storytelling. In A. Isman, H. F. Odabasi, & B. Akkoyunlu (Eds.), *Educational Technology Literacy*. Ankara: TOJET.
- Tatum, M. (2009). *Digital storytelling as a cultural-historical activity: Effects on information text comprehension* (Doctoral dissertation). University of Miami, Miami.
- Turkmen, H., & Ünver, E. (2012). The narrative technique in science education. *Journal of European Education*, 2(1).
- Xu, Y., Park, H., & Baek, Y. (2011). A new approach toward digital storytelling: An activity focused on writing self-efficacy in a virtual learning environment. *Educational Technology & Society*, 14(4), 181-191.
- Yakinci, C., Almis, H., & Kavruk, H. (2012). The power of story-telling in medical education. *Cocuk Sagligi ve Hastalıkları Dergisi*, 55(4).
- Yang, Y.-T. C., & Wu, W.-C. I. (2012). Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study. *Computers & Education*, 59(2), 339-352. <http://dx.doi.org/10.1016/j.compedu.2011.12.012>
- Yigit, E. O. (2007). *The effect of storyline method on student achievement about the sources of our country unit in 6th grade social studies curriculum* (Master's thesis). Abant İzzet Baysal University Social Sciences Institute, Bolu.
- Yildirim, A., & Simsek, H. (2011). *Qualitative research methods in the social sciences*. Ankara: Seckin Publishing.

<http://www.ejmste.com>