การพัฒนาเว็บเพื่อการเรียนรู้โดยใช้วิธีการเล่าเรื่องดิจิทัล เพื่อส่งเสริมสงวนรักษามรดกทางวัฒนธรรม

Developing Web-based Learning through Digital Storytelling to Enhance Cultural Heritage Preservation

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อพัฒนาเว็บเพื่อการเรียนรู้โดยใช้เทคนิคการเล่าเรื่องดิจิทัลเป็นขั้นตอนหลักในการเรียนรู้เพื่อส่งเสริมการสงวนรักษามรดกทางวัฒนธรรม วิธีการดำเนินการวิจัย แบ่งออกเป็น 3 ระยะ ประกอบด้วย ระยะที่ 1 ศึกษาและออกแบบกระบวนการจัดการเรียนรู้โดยใช้การเล่าเรื่องดิจิทัล ระยะที่ 2 พัฒนาเว็บไซต์ส่งเสริมการจัดการเรียนรู้โดยใช้วิธีการเล่าเรื่องดิจิทัล และระยะที่ 3 ศึกษาความพึงพอใจของผู้เรียนที่มีต่อการใช้งานเว็บไซต์ส่งเสริมการจัดการเรียนรู้ฯ เพื่อส่งเสริมการสงวนรักษามรดกทางวัฒนธรรมกลุ่มตัวอย่างที่ใช้ในการศึกษาครั้งนี้ แบ่งออกเป็น 2 กลุ่มได้แก่กลุ่มผู้เชี่ยวชาญ

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และกลุ่มผู้เรียนระดับปริญญาตรี ผลการศึกษา พบว่า การพัฒนากระบวนการจัดการเรียนรู้โดยใช้เทคนิคการเล่าเรื่องดิจิทัลประกอบด้วย 10 ขั้นตอน ได้แก่ 1) กำหนดแนวคิด 2) วางโครงเรื่อง 3) ค้นคว้าข้อมูล 4) บอกเล่าเรื่องราว 5) วิเคราะห์องค์ประกอบ 6) รวบรวมสื่อ 7) สร้างสรรค์เรื่องราว 8) ปรับปรุงสื่อ 9) แบ่งปันเรื่องราวและ 10) สะท้อนคิดจุดเน้นของงานวิจัยนี้คือ ผู้วิจัยได้นำแนวคิดของการใช้สื่อดิจิทัลและเทคโนโลยีเพื่อส่งเสริมให้ผู้เรียนเกิดความสนใจและตระหนักในเรื่องการอนุรักษ์และเผยแพร่มรดกทางวัฒนธรรม

คำสำคัญ: การเล่าเรื่องดิจิทัล มรดกทางวัฒนธรรม การเรียนรู้บนเว็บ กระบวนการเรียนรู้

ABSTRACT

The purpose of this study is to develop web-based learning using digital storytelling technique to enhance cultural heritage preservation. The investigation is undertaken in 3 parts. Part one is the exploration for process and design of the web-based learning using digital storytelling technique. Part two consists of the development of the website which promotes learning through digital storytelling. Part three is involved with the determination of the learners' satisfaction on the website use. The findings indicate that the development of the web-based learning process comprises 10 steps: 1)story concept defining, 2) developing story core, 3) information searching, 4) script writing, 5) storyboarding, 6) media gathering, 7) production, 8) revision, 9) story sharing, and 10) Reflection. In this research, the researchers focus on the application of digital technology to increase learners' awareness and understanding in the cultural heritage preservation and dissemination.

Keywords: Digital Storytelling Cultural heritage Web-based Learning Learning Process

INTRODUCTION

Technology advances today have resulted in changes in developments in information management. Information resources are increasingly stored in digital form. This has created the concept of conservation and the extension of information in a variety of forms. This ensures that cultural maintenance can be done in several ways. Nowadays, there is an increasing number of management applications with regard to technology relating to storage, knowledge management systems, listing metadata, and digitization (Chaichuay, 2017). We can use technology as a medium for delivering content or for simulating resources in order to provide services to users. For instance, we can use virtual reality with regard to content presentation and in terms of access to cultural heritage in such a way as to allow viewers to learn on their own (Nemtinov et al., 2016; Green, 2007). They can increasingly learn and add value to their cultural heritage through the use of websites. In particular, technology has helped to convey many historical stories. For example, Lombardo & Damiano (2012) have used storytelling techniques on mobile devices for guiding visitors to cultural heritage sites. Furthermore, Dal Falco & Vassos (2017) have introduced integration between artefacts and information by providing visitors with a tourism experience, exposing them to cultural resources through experiences in storytelling, and using the capabilities of technology in the form of presentations (Palombini, 2016). In this way it can be seen that the application of technology can significantly facilitate learning about cultural heritage. Narration as part of cultural heritage, in addition to preserving valuable legacies, broadcasts or tells stories through the use of stored digital resources in such a way as to add value, and makes such stories even more interesting (Adabala et al., 2010; Huion, 2015).

This research has introduced the concept of digital storytelling as a means of enhancing meaningful learning experiences for learners in such a way as to capture the learners' interest and attention, to encourage them to study and search

for information, and to find evidence from various sources, including historical evidence, narratives or other learning resources. It also encourages them to create stories and to convey their own perspective through the use of digital technologies. This not only helps learners become aware to the process and how to tell the story, it also means that they can pass on their experiences, emotions, perspectives, and attitudes towards the story. This is because the learners find out how to study and compile information effectively (Yang & Wu, 2012). This use of narrative is a development of the learners' thinking processes in another way (Skouge & Rao, 2009). The main purpose of this research is to develop web-based learning using digital storytelling as a stepping-stone in the creation of narrative to enhance cultural heritage preservation.

CONCEPTUAL FRAMEWORK

A. Digital storytelling

Digital storytelling is the practice of using digital tools, video or hand-drawn images, scanned images, photographs, graphics, texts, recorded audio, music, sound effects, not to mention the learners' own voice in narrating, to tell stories. Narrators are considered creators and producers rather than consumers, since they pass through the traditional writing processes of brainstorming, selecting a topic, drafting, conducting research, writing a script and developing an engaging story which they then supplement with multimedia tools. Finally, the digital stories can be played on a computer, and uploaded onto a website or online channel (Ohler, 2013; Robin, 2016). Moreover, digital storytelling has the potential to engage learners in integrated approaches to learning involving digital media. Digital storytelling encourages learners' motivation, and helps teachers to build constructivist learning environments (Smeda, Dakich & Sharda, 2014; Robin, 2016). In this research, we review the literature related to the digital storytelling process in order to propose guidelines for the development of a learning process involving web-based learning

(Gregori-Signes, 2008; Yang and Wu, 2012; Morra, 2013; Ohler, 2013; Papadopoulou & Vlachos, 2014).

B. Cultural Heritage

Cultural heritage is an expression of the ways of living developed by a community and passed on from generation to generation. This includes customs, practices, places, objects, artistic expressions and values. Cultural heritage is often expressed as either intangible or tangible cultural heritage (ICOMOS, 2002). Tangible cultural heritage refers to things that we can store or physically touch. Examples of tangible cultural heritage includes artifacts, buildings or landscapes. On the other hand, Intangible cultural heritage includes voices, values, traditions and oral history. Popularly, this is perceived through cuisine, clothing, forms of shelter, traditional skills, technologies, religious ceremonies, performing arts, and storytelling (UNESCO, 2003).In this research, we aim to encourage learners to investigate stories by themselves both the tangible and intangible cultural heritage of communities.

In the study of the development web-based learning through digital storytelling to enhance cultural heritage preservation, the researchers have proposed conceptual frameworks and theories from previous research and come up with a conceptual framework which is composed of three elements: 1) Input in the form of evidence or stories of the cultural heritage which is of interest to the learner. 2) The researcher surveying the literature related to digital storytelling to synthe size and develop learning processes on the website, and using these steps to allow learners to create cultural digital storytelling.The last element is divided into two parts in the form of output from the learning process and learning outcomes. Details of each element can be seen in Figure 1.

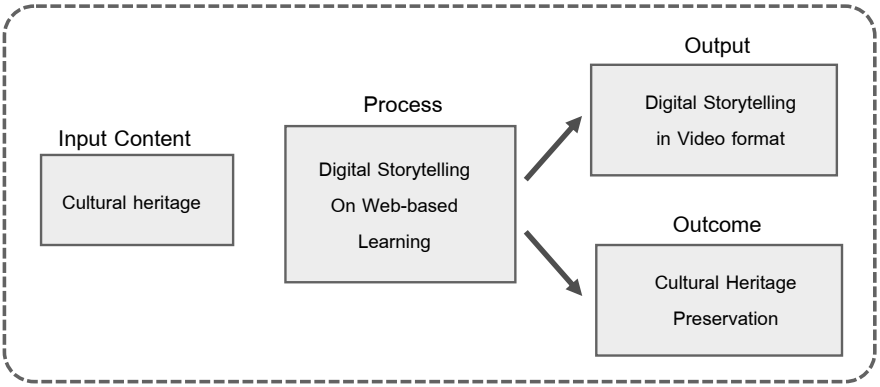

Fig. 1 Conceptual Framework of Developing Web-based Learning through Digital Storytelling to enhance Cultural Heritage Preservation

METHODOLOGY

A. Participants

The sample groups for this study were divided into two experts and undergraduate students. The details are as follows:

1. Experts: this group of participants was chosen using the purposive sampling approach and was divided into these 2 sub-groups;

1.1 Three experts were involved in the interviews regarding the digital storytelling process**.** The criteria for the selection of these experts were that they were lecturers at university level who had at least 10 years' teaching experience, and who had knowledge and specialisms in the areas of educational technology, learning design and development.

1.2 Five experts were involved in the evaluation of the web-based learning through digital storytelling. They were chosen from experts with 10 years' experience of web design for learning, and of online learning management.

2. The samples of learner were selected using purposive sampling. There were using the following two criteria: first, students who are currently of an

undergraduate degree in the field of Information Management. Second, they needed to have the information literacy background and good skill for use of technology. Participants were selected from students who are currently in the third year of an undergraduate degree in the field of Digital Information Management in the School of Informatics, Walailak University. In total, 17 participants who were enrolled in course DIM-362 - Information Repackaging and Dissemination - and were studying during the second semester of 2017.

B. Instruments

This research instruments consisted of 3 types:

1) Learning process assessment instrument
2) Web-based design assessment instrument
3) Web-based learning satisfaction assessment instrument.

The measurement instrument was prepared from the literature and previous research and content validity (Content Validity Index: CVI) by using Lynn's index (Lynn, 1986). Three experts in the field of Educational Technology and Educational Measurement and Evaluation evaluated the questionnaire's linguistic accuracy. The standard content validity was estimated as 0.88 (S-CVI/Ave). The total individual content validity index (I-CVI) was higher than 0.67 and was considered acceptable.

C. Research Process

Our goals are developing web-based learning through digital storytelling for cultural heritage preservation. The study was divided into 3 phases as follows:

1st Phase: Digital storytelling process study and design

This phase aimed to study, analyze, and synchronize the digital storytelling process according to the following steps;

1.1 Complete a review of the literature related to the digital storytelling process written by Gregori-Signes (2008), Yang & Wu (2012), Morra (2013), Ohler (2013), Papadopoulou & Vlachos (2014).

1.2 Synthesize and develop the learning process using digital storytelling.

1.3 Provide the in-depth interview form that is related to the digital storytelling process.

1.4 Interview the three experts and analyze the results of the evaluation of the suitability of the learning process.

2nd Phase: Web-based learningdevelopment integrated with the digital storytelling process

This phase aimed to design and develop web-based learning which adapted the 1st phase learning process in websites with the following procedures:

2.1 Study website development-related framework, theory, and research.

2.2 Design the website structure.

2.3 Design the User Interface Wireframe through the 10 procedures associated with digital storytelling.

2.4 Develop the cultural heritage search system after the learners had developed the storytelling video for broadcast on Youtube.

2.5 Provide a website design assessment procedure in order for it to be considered by the 5 experts.

2.7 To analyze the assessment results through arithmetic mean ($\bar{x}$) and standard deviation (SD) based on a 5 level Likert Rating Scale in order for the outcomes to be improved and tested by the learners.

3rd phase: The study of the learners' satisfaction with regard to web-based learning in terms of cultural heritage preservation.

This phase aimed to study the satisfaction of learners with regard to web-based learning based on the following steps:

3.1 Complete a review of the literature related to designing the questionnaires in term of effectiveness of the web-based learning design.

3.2 After the learners completed all the activities, the final outcome would be in the form of a video related to cultural heritage storytelling.

3.3 After data was collected, the researcher would draw together the potential assessment results to be analyzed in terms of frequency, percentage, mean, and standard deviation calculations. The data would then be presented in the analysis table for further reference.

RESULTS

The research results with regard to developing web-based learning using digital storytelling to enhance cultural heritage preservation are as detailed below.

1. Digital storytelling learning procedure results

Preliminary finding: the researcher synchronized the digital storytelling procedures from an extensive review of the literature in order for the cultural heritage stories providing guidelines for the learners. After the interview, the 3 assessors assessed the digital storytelling process into 10 procedures as referred to in Table 1.

Table 1. Digital Storytelling Procedures

Procedures	Details
1.Thinking about a story	This is the first stage of the cultural heritage storytelling preparation. This stage involves creating an idea that launches the story.
2. Developing the story core	In this stage, the learners should be able to define the scope of cultural heritage storytelling.

Procedures	Details
3. Researching	This stage involves researching the digital storytelling data from a range of information sources. Consequently, the learners have to determine the assessment criteria for each information source.
4. Scripting	In this stage, the learners have to provide the context through information source analysis and synchronize the new information in the form of a script to tell the story from own perspective.
5.Storyboarding	This stage involves analyzing the media composition in order to develop interesting storytelling through the use of a storyboard as a key story design instrument.
6. Media gathering	To gather any representative media. These can be divided into two types; the learners' self-media and online media. The learners have to recognize the ethical issues surrounding the access and use of information.
7.Production	The learners should be able to provide cultural heritage storytelling by themselves. Consequently, they have to learn how to use the program and find the basic solution.
8. Revision	The learners would present the digital story to the instructors and other participants along with any comments, as well as providing some creative ideas in order to lead to further collections and improvements.
9.Story sharing	To broadcast the improved digital storytelling via the online media through the provision of correct information and context.
10. Reflection	The learners should think about and review how they dealt with the process in every stage, as well as how they might improve and develop the solution. In addition, this stage also involves exchanging the outcomes between the participants in order to share their experiences and procedures.

2. Web-based digital storytelling learning procedures development results

The development of a site of the web-based learning using digital storytelling as a key step in the development of content, students are required to follow the 10 digital storytelling steps as shown in Figure 1. When the learner develops a cultural heritage narrative by following the learning process, the result is a cultural heritage narrative in video format. This will be imported into the system for the sake of researching and learning. The students can search for the digital narrative under web-based learning by browsing and searching, as shown in Figure 2. The system will show the search results by presenting the digital narrative in line with the interests of the students (Figure 3). This is turn will allow the learner to research, study, and seek for historical stories that are linked.

Fig. 1 Sample page in digital storytelling steps

Fig. 2 The development of cultural heritage storytelling search system

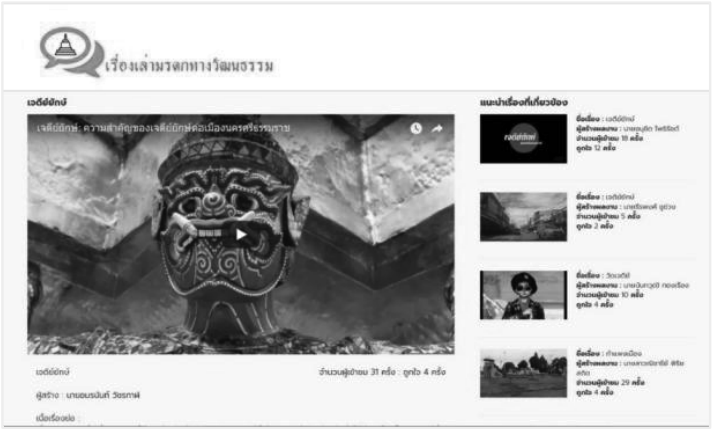

Fig. 3 Results of cultural heritage storytelling

The potential assessment results found that the website use was divided into 2 parts: the website design analysis results and the web-based learning management composition (Tables 2 and Tables 3).

Table 2 The analysis of the website design

Consideration issues	($\bar{x}$)	SD	Level of agreement
1. Type of letter	4.00	0.00	agree
2. Color of letter	4.00	0.00	agree
3. Size of letter	4.00	0.00	agree
4. The meaning of the illustrations	5.00	0.00	strongly agree
5. The differences in the foreground and background colors	4.67	0.58	strongly agree
6. Beautiful, comfortable, not flashy	5.00	0.00	strongly agree
7. Use of color to highlight text	5.00	0.00	strongly agree
8. Difference in hypertext links	4.33	0.58	agree
9. Ease of use	4.00	0.00	agree
10. Continuity of internal linking with no broken links	4.67	0.58	strongly agree
11. Accuracy in terms of linking to other websites	4.67	0.58	strongly agree
12. Supports display on smartphones or handheld devices	5.00	0.00	strongly agree
Total mean	**4.53**	**0.58**	**strongly agree**

An analysis of the information in Table 2 reveals that the experts strongly agree overall in terms of the cultural heritage website design (total mean 4.53). Most of the experts agree as to the interpretation of the illustrations, their beauty, and comfort of use, the lack of flashiness, the use of color to highlight the message, and the display being supported on smartphones or handheld devices is deemed to be at the highest level ($\bar{x}$5.00).This is followed by the difference between the foreground and the background colors, the continuity of the internal linking, there being no broken links, and the accuracy in terms of linkage to external sites, all of which are assessed at a high level ($\bar{x}$4.67). The lowest ranking

relates to the font used, color, size and ease of use. However, these aspects are still ranked at a high level ($\overline{x}$4.00).

Table 3 Web-based Learning Management Composition

Consideration Issue	$\overline{x}$	SD	Level of agreement
1. Instructor and learners communication method	4.60	0.55	strongly agree
2. Learning plan activity schedule	4.20	0.45	agree
3. Learning target defining for assessment	4.40	0.55	agree
4. Formal learning media sufficiency	4.00	0.71	agree
5. Self-learning source suggestion	4.00	0.71	agree
6. Sample alphabetical digital storytelling presentation	4.60	0.55	strongly agree
7. Briefed creator information	4.60	0.55	strongly agree
8. Storytelling “like” attraction	4.40	0.89	agree
9. Requested output presentation	4.40	0.55	agree
10. Interesting issue-related presentation	4.60	0.55	strongly agree
11. Learners’ self-study support	4.60	0.55	strongly agree
12. Learners’ technological adaptation for creative digital media providing	4.60	0.55	strongly agree
13. Possible schooling adaptation	4.60	0.55	strongly agree
14. Cultural heritage preservation schooling activity support	4.80	0.45	strongly agree
Total Mean	**4.46**	**0.58**	**agree**

An analysis of the information in Table 3 reveals that the experts strongly agree overall in terms of the web-based learning management composition (with a total mean of 4.46). Most of the experts agree as to the schooling activities being able to support the learners in terms of cultural heritage preservation (4.80).

This is followed by the instructor and learners communication method, the sample of the alphabetical digital storytelling presentation, interesting issue-related presentation, learners' self-study support, learners' technological adaptation for providing creative digital media, and possible schooling adaptation (4.60). This information also indicates that the experts agree that the sufficiency of the formal learning media and self-learning source suggestions, were rated at the lowest level (4.00). Consequently, the experts suggested the need to increase the number of information sources in order to act as sources of learning for the learners.

3. Evaluation of the Website Using Satisfaction Assessment

In terms of the results of the evaluation of the degree of learners' satisfaction in terms of the websites affecting the cultural heritage preservation support,the website using satisfaction assessment results were obtained from the 17 samples. The results are shown in Table 4.

Table 4 Website Using Satisfaction Assessment Result

Consideration Issue	$\overline{X}$	SD	Level of agreement
1. Sufficient Instruction media	4.53	0.51	strongly agree
2. Self-learning source suggestion	4.41	0.62	agree
3. Learning news announcement area	4.59	0.62	strongly agree
4. Usability menu learning ranking	4.59	0.62	strongly agree
5. Weekly school record announcement and school work submission monitoring	4.47	0.62	agree
6. Learning support online instruments	4.59	0.62	strongly agree
7. Alphabetical order digital storytelling presentation	4.12	0.60	agree
8. Briefed creator information	4.06	0.56	agree

Consideration Issue	$\overline{X}$	SD	Level of agreement
9. Letting the learners “Like” the digital storytelling	4.24	0.83	agree
10. Requested digital storytelling searching output presentation	4.47	0.62	agree
11. Interested issue related recommendation	4.41	0.62	agree
12. Storytelling recommendation to further following.	4.41	0.62	agree
13. The proper cultural heritage presentation through digital storytelling	4.65	0.61	strongly agree
14. The learners’ additional learning activity support	4.59	0.51	strongly agree
15. The learners’ cultural heritage preservation learning activity support	4.59	0.51	strongly agree
Total Mean	**4.45**	**0.61**	**agree**

It can be seen from Table 4 that the overall degree of learners’ satisfaction was at a high level with a total mean of 4.45. Most of the students were satisfied with the proper cultural heritage presentation through the digital storytelling,and assessed it at the highest level (4.65). Secondly, some were of the opinion that the learning news announcement area, sufficient Instruction media, usability menu learning ranking, learning support online instruments, the learners’ additional learning activity support, and the learners’ cultural heritage preservation learning activity support were also at a very high level (4.59). This information also indicates that the learners agree that giving briefed creator information, were rated at the lowest level (4.06).

DISCUSSION

The preliminary findings of this research revealed that the assessors considered the potential of web-based learning design to be at the highest level in

terms of coloring, monitor design, structure, website internal and external connections, including the support output of various devices. In terms of web-based learning management, composition assessment found that the assessors considered that any learning activities would activate and support the learners in terms of developing cultural heritage preservation concerns at the highest level, since digital storytelling could make the learners represent their opinions. However, the learners should search for issues they are interested in, especially historical issues, which would include some beliefs and perspectives with regard to its background. As a result, the study indicates that the presenting of a cultural heritage narrative via using a digital storytelling gives students an opportunity to study, research, ask questions, collect the data, analyze and synthesize the content, and convey their own perspective by using many forms of digital tools and media to communicate with audiences and make the story more interesting. This conforms to the finding Grant & Bolin's study (2016) who mentioned that narrative delivered via digital media improves the students' learning and how to meaningfully and profoundly reflect on their knowledge through conveying their knowledge and communicating with the audience.

In addition, the learners reflected on the satisfaction assessment outcome at the highest level with regard to the issue of digital storytelling for publicizing historical stories. This was the case since history should be studied from the point of view of the learners' actual interest and curiosity. This provides them with questions and stimulates research to answer these, including self-learning experiences that encourages the learners to be active when it comes to learning and encourages them to apply more technological meaningful learning. This conforms to the findings of Widjajanto, Lund & Schelhowe (2008) who developed tools on a website entitled Wayang - the name of a character in the performing arts shadow show popular in Indonesia. By using these tools in digital narratives for kids, they found that it makes the children more interested in the story, and

makes them create a narrative community to exchange, share stories, and comment on each other's' stories. Furthermore, the research by Adabala et al. (2010) found that the use of interactive multimedia in digital heritage narratives, by telling history and using the perceptions of the local community around a temple in the south of India, made the user satisfied with the learning and that they experienced more by watching the narration.

After reviewed the stories it was found that our findings complied with those of the study by Huion (2015) who showed that if any contents dealt with cultural heritage, the learners could learn about features such as personality, tradition, worship, social values and norms. They would develop some new learning processes to explain and tell any stories in an interesting manner. Moreover, the learners had already developed their communication skills well through the information research process. This allowed them to adapt their storytelling and share their cultural heritage through the digital storytelling media. This gave the learners opportunities to learn, to research, to question, to collect data, to analyze, and to synchronize any content, as well as express their own concepts based on the potential of various digital and multimedia instruments for a variety of audiences through the use of more interesting content.

In addition, Barrett (2006) said that digital storytelling provided the learners with development which allowed them to reflect meaningful and in-depth knowledge for various audiences. This complied with Yang & Wu (2012) who found that digital storytelling could increase the in-depth contents recognition on the part of the learners (Barrett, 2006; Verdugo & Belmonte, 2007; Bratitsis et al., 2012; Yang & Wu, 2012). The main concern of digital storytelling was to consecutively provide the viewers witha relationship and motivation to encourage them to follow the story. This includes the direct experiences of the tellers. As a result, the cultural heritage story would be valuable and could be implemented by both receivers and audiences.

CONCLUSIONS

This study aims to develop web-based learning through digital storytelling to support cultural heritage preservation. The researcher designed the digital storytelling learning process to included ten stages: 1. Thinking about a story 2. Developing the story core 3. Researching 4. Scripting 5. Storyboarding 6. Media gathering 7. Production 8. Revision 9. Story sharing, and 10. Reflection. Following this process, the learners would learn about digital storytelling on web-based learning. The results should be that the learners would develop the potential to use digital media to create video files to publicize their own cultural heritage stories. These differed from any other digital media because it would be presented from the learner's own study. After that, the content would be developed and created as a cultural heritage story to demonstrate its preservation value. This would include such aspects as historic sites and relics as well as folklore, to instill an understanding into the minds of the younger generation and let them present this understanding from their own perspectives. In addition, this developed learning website contains all of the learners' digital storytelling, provides search and outcome functions, and recommends any additional interesting digital storytelling content as options for further learning. The results of this study indicate that technology integration in teaching (e.g. digital media, web-based learning, and digital storytelling) will be helpful in raising their interest and awareness in historical areas and cultural heritage education.

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