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Research Article

Digital Storytelling Media Online via Gamification Model to Promoteof Digital Literacy Skills for Undergraduate Students in Thailand: A Systematic Literature Review

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Abstract: The objective of this research was to conduct a systematic literature review (SLR) from which Digital Storytelling Media Online via Gamification Model To promote of Digital Literacy Skills for undergraduate students in Thailand was conceptualized. A total of 72 topics from local and international books, research papers, articles, and relevant documents were analyzed and synthesized using the systematic literature review method. Initially using a mixed methods approach, a six-step Digital Literacy Process (DSML-Gami Model) was conceptualized. After that, a panel of nine experts gave input into the model's design . The six DSML-Gami Model steps included; They consist of 1) information accessibility, 2) management, 3) evaluation, 4) conclusion, 5) creation, and 6) communication. The results of the model encourage undergraduate students to use digital literacy skill. Also, students who studied with DSML-Gami Model ability were satisfied with the model.

Keywords: Digitalstorytelling, Gamification, Digital literacy skills, UndergraduateStudents

1. Introduction

Digital literacy skills are essential in the current world as they can be implemented for developing the nation as well as society. Skills come with technological availability. Digital literacy evolves and advances education as a basic structure. It is a development tool to create new knowledge in the changing digital world.

21st Century skills are relevant to digital literacy skills. They are essential skills for diverse learners. Therefore, it is important to focus on future working skills for people in the country. Digital literacy skills are essential for students in the 21st century. They need to have knowledge and digital intelligence **(Partnership for 21st Century Learning, 2009, p. 5 ;UNESCO, 2011;Whereas Deakin University Library, 2014; P. Wannapiroon, 2014 ; Livingstone, S.et.al, 2017; Aumgri.C &Petsangsri.S, 2019)**. It also conforms to the Digital Thailand Strategic Plan **(Sarnok. K. et. al, 2019; Jitvirat. K, 2019; National Economic and Social Development Board, 2018)** which focuses on the development of human ingenious digital technology competency and creativity, as well as technology sense.

Gamification is a teaching platform in the 21st century that can be adapted in various ways. The mechanics and the experience of the designed game are implemented to connect and pursue students to their goals **(Ministry of Information and Communication Technology, 2016; Ministry of Information and Communication Technology, 2011; Burke. B, 2014; Hung, A. C. Y, 2017)** Students interact with learning society. It is active learning via gamification when scores are given and ranked. Students can use technology to check their study results. Thus, many educators agree that the concept of implementing gamification for education can reinforce cognition, emotion, and society for students who learn by playing games and receiving rewards when passing higher game levels. It aims to prove cognitive, emotional, and social developments that could occur when students receive instructions or are involved in group work **(Nicholson. S, 2015; Khlaisang. J, 2019; Dominguez. A. et. al, 2013; Rahmawati. Y. et. al, 2019; Koivisto, J., &Hamari. J, 2019).**

The development of digital literacy skills can help with learning management and work production from the application of the tool so students can create and develop their works. Studies support that digital storytelling media online is one of the methods used to reinforce digital learning **competence (Rodrigues. L. F. et. al, 2019; Benmayor. R. B, 2008; Robin, Bernard. R, 2016; Razmi, . et. al, 2014).** Digital tools can also narrate compelling stories. Digital storytelling is adapted in education by presenting stories via multimedia that can capably attract students' interests. It can also arouse classroom teaching and learning. Digital storytelling media online can develop students' various skills, i.e. writing skills and digital tool implementation **(Bratitsis. T & Petros. Z , 2015).** This corresponds to **(Dush. L, 2014)** which stated that digital storytelling could capably help

develop crucial skills for students in the digital world. Students can have technology skills so they can work and live effectively in the world society by implementing knowledge and the learning platform for work and daily living.

2.Literature reviews

2.1 Digital storytelling media online.

It can be summarised from the educators **(Bermudez. A, 2016; Dicheva. D. et. al, 2015; Sangkatekit. S&Aumgri.C, 2020; Kunanurak1. N &Aumgri. C, 2020)** that digital storytelling media online consists of text, illustration, narration, motion pictures, or brief storytelling method which takes about 2-15 minutes. Digital storytelling media online allows students to use electronic devices to learn through short animated stories of which each chapter summarises contents from the students' papers. The stories are told via digital and technological characters, scenes, and gestures of characters, including illustration, animation, sound, video, or game application on cloud technology. Digital storytelling media online **(Bermudez. A, 2016; H.A.Alismail, 2015; Aumgri. C &Apirating. K, 2019)** composes of text, illustration, narration, motion pictures, or brief storytelling method, which takes about 2-15 minutes. Digital storytelling allows students to use electronic devices to learn through short animated stories of which each chapter summarises contents from the students' papers. The stories are told via digital and technological characters, scenes, and gestures of characters, including illustration, animation, sound, video, or game application on cloud technology. Digital storytelling can stimulate students' creativity for their learning and future work.

2.2 Gamification

Educators said that the significance (**Huang. B. et. al, 2018; Na Songkhla. J, 2018; Kapp. Karl. M,2012; Payormhom. B &Aumgri. C, 2021)** of gamification in learning is the mechanics of the game including point, level, reward, and achievement. It is a quiz game that defines the score for each question. It can either attack the opponents or lower their ranks when they constantly give wrong answers. The fun mechanics and components of the game will arousemore class involvement, interest, excitement, and learning motivation.

2.3 Digital literacy skills

Educators note that the significance **(California Emerging Technology Fund, 2008; Jutrakol. S, 2017; UNESCO, 2011; OECD, 2017; California Emerging Technology Fund, 2008; Jutrakol, S, 2017; Organisation for Economic Cooperation and Development, 2017)** of digital literacy skills is a student's ability to adapt information technology and digital media in education, work, profession, or entertainment. It can create knowledge content from digital media through analysis, synthesis, and consideration.

3.Objectives of the Study

- To analyze and synthesize the Digital Storytelling Media Online via Gamification Model to Promote of Digital Literacy Skills.

4. Methodology

The study was conducted on the basis of a documentary research method by examining documents, books, textbooks, research papers. The study was divided into two levels as (1) studying books by considering keywords from the titles associated with the issue of the study consistent with the research objectives. There was a total of 32 titles composed of 16 Thai language documents and 20 foreign language documents, and (2) studying from research papers and articles by considering keywords from the titles associated with the issue of the study consistent with the research objectives. There was a total of 36 titles comprising 15 in Thai language and 21 in foreign languages. Those documents were prepared during 2004-2020. The details are shown in Table 1

Table 1 . Details of the source of information used in the study.

Sources of Information	Type of Information Sources	Title	Total/Title
Domestic	1. Books	16	31
	2. Research papers/articles	15	
International	1. Books	20	41
	2. Research papers/articles	21	
Total			72

5.Research Methods

5.1 Collected and studied various documents in the form of books, research papers, and articles related to the theoretical concept being studied.

5.2 Conducted a content analysis from the various documents collected in a systematic manner (systematic analysis) to obtain a body of knowledge that the researchers could manage Digital Storytelling Media Online via Gamification Model to Promote of Digital Literacy Skills.

5.3 Conducted content synthesis and integrated the body of knowledge obtained from the previous procedure to develop the expected learning model.

6.Research Results

6.1. Learning process using the digital storytelling platform

The components of the learning process using digital storytelling media online consists of 7 steps, which are 1) script writing, 2) story setting, 3) script edition meeting, 4) sequence of shot, 5) narration addition, 6) sound effect and transition addition, 7) music addition as shown in figure 1.

Figure 1. Diigital Storytelling Online Process

From Figure 1, the components of the learning process using digital storytelling media online started from lesson planning. The teacher analysed and synthesized the course's objectives, standards, descriptions, and competency of teacher profession qualifications, then created digital storytelling work for lesson content done by implementing 7 steps, i.e. 1) script writing, 2) story setting, 3) script edition meeting, 4) sequence of shot, 5) narration addition, 6) sound effect and transition addition, and 7) music addition. The lesson plans were made and their appropriateness evaluated by the experts.

6.2 Gamification learning management

The components of gamification learning management comprise 5 steps, which are 1) game mechanics, 2) point, 3) level, 4) reward, and 5) achievement, as shown in Figure 2.

Figure 2: Gamification Learning Management Process

From Figure 2, the teacher analysed and synthesized the course's objectives, standards, description, and competency of teacher profession qualifications. Then, class activities were determined using gamification mechanics for students to review lessons by implementing 5 steps. Firstly is the game mechanics, which is when the appropriate game format applied under control for students who take part in the game can give answers for reviewing the lessons created by the teacher. Secondly is the scores given after answering questions. Thirdly is level, which is the rank of students whose scores are accumulated from their correct answers. Then, there is a

reward, which is given to students by the teacher after finishing the game. Lastly is an achievement, which is involvement in the quiz games where students give their answers in each lesson.

9.3. Learning steps for digital literacy skills

The researcher synthesized the learning steps of digital literacy skills in order to get the appropriate steps in developing the platform focusing on digital literacy skills. They consist of 1) information accessibility, 2) management, 3) evaluation, 4) conclusion, 5) creation, and 6) communicationin Figure 3.

Figure 3: Digital Literacy Process

From Figure 3, the teacher synthesized the learning steps focusing on developing digital literacy skills from 6 steps. The development of the learning platform was conducted through the work and learning activities of students. Firstly is information accessibility, which involves searching, identifying, and collecting data. Secondly is information management, which means information search, information management, information categorising, and data collection. Thirdly is evaluation, which includes information categorisation, data comparison, and information check. Then, there is the conclusion, which includes data analysis, information link, data synthesis, and data conclusion. Next is data creation, which comprises work design, work development, and work application. Lastly is communication, which involves information presentation, posting comments, communication, and cooperation.

9.4. DSML-Gami learning format to reinforce digital literacy skills

The DSML-Gami learning format to reinforce digital literacy skills is divided into 2 parts.

Part 1: Input Process comprises of curriculum analysis, designation of assignment, evaluation, users of learning format

Part 2: Input Process consists of the digital storytelling learning process, gamification learning management, learning process of digital literacy skills

Part 3: Output Process comprises evaluation

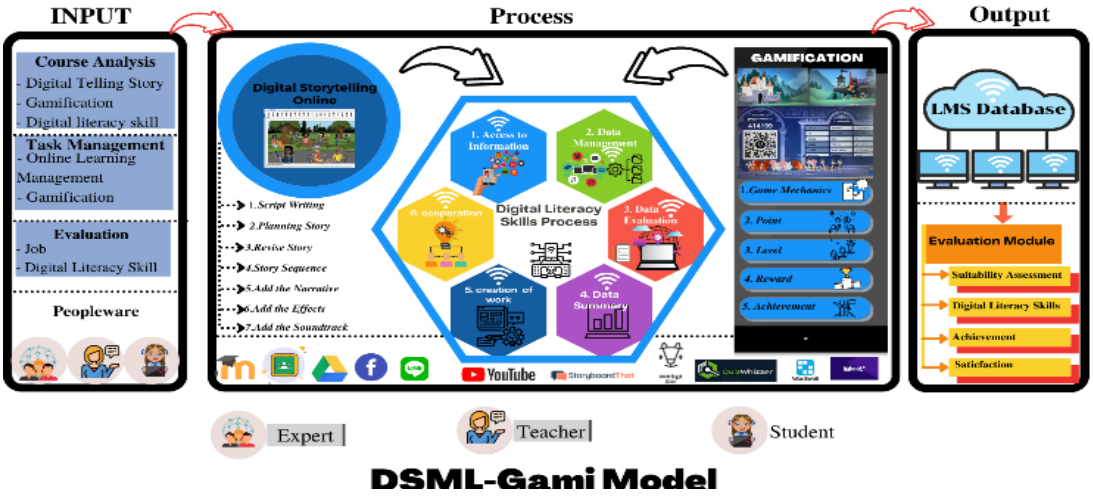

Figure 4: DSML-Gami Model

Figure 4 shows the relation between the components of DSML-Gami format to reinforce digital literacy skills.

Part 1: Input Process: It is a part of the course analysis. Lesson planning in the form of DSML-Gami to reinforce digital literacy skills can be described below.

Course analysis was conducted by analysing and synthesizing course objectives, course standards, course descriptions, and competency of the teaching profession. A lesson plan was then made corresponding to digital literacy skills, with appropriateness evaluated by the experts.

Designation of the assignment was the assignment of learning activities and worksheets related to digital literacy skills from online lessons and the gamification learning platform. It consists of the work process, defining of objectives, contents, test, worksheet, work creation process, and performance evaluation.

Appropriateness evaluation was conducted by making a lesson plan that corresponded to digital literacy skills. The appropriateness of the plans was evaluated by nine experts who had graduated with a doctoral degree and had at least 5 years of teaching experience in university in addition to being proficient in the DSML-Gami format to reinforce digital literacy skills. They were experienced in teaching media, computer, gamification, curriculum, and teaching in university.

Users of the learning format were studied by determining the persons involved in the DSML-Gami format to reinforce digital literacy skills. They were experts who evaluate and give counsel for improvement and development. The teacher teaches and determines learning activities. The student is the user of the set learning platform.

Part 2: Input Process: It is a learning process using digital storytelling media online to create digital-storytelling-related works with the gamification learning process, in the form of a suitable quiz game, for reviewing lessons and to create works that can identify learning steps of digital literacy skills from the application of digital media.

Part 3: Output Process: It can be divided into 2 modules, which are the evaluation module and the online learning module. The evaluation module is a part of work evaluation using the DSML-Gami scoring rubric to reinforce digital literacy skills. It consists of appropriateness evaluation, student's digital literacy skills, an inspection of platform efficiency, users' satisfaction study. The online learning module comprises the login system, class attendance, course syllabus, assignment submission, test completion, the use of a web board.

7.Conclusion

The DSML-Gami format to reinforce digital literacy skills for students in the Computer Education Programme can be divided into 3 parts. The first part is the input process, which comprises curriculum analysis, designation of work, evaluation, and users of the learning platform. The second part is the input process, which consists of the digital storytelling learning platform, the gamification learning management process, and the learning process for digital literacy skills. The third part comprisesevaluation. The research results correspond to the appropriate digital literacy skills as a component of teaching standards conforming to the professional standards for computer teachers. In addition, the implementation of digital storytelling and gamification mechanics in teaching can provokea more exciting, enjoyable, and effective learning environment. The results corresponding in this research appear to show that digital literacy skills can truly promote academic efficiency and achievement from practice. It can be implemented in each step of students' actual work creation. The work can be publicised and extended effectively to future professional practice, which conforms to the essential skills for the nation in the future.

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