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The development learning model of flipped classroom with digital storytelling for department of computer education

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Abstract

The objectives of the study were to: (1) Develop and study the efficiency a flipped classroom learning model with online digital storytelling for the department of computer education; (2) Compare the learning achievement of the learners before and after learning with the developed learning style; and (3) Study the satisfaction of the learners after learning with a flipped classroom learning model with an online digital storytelling method developed with the tools used in the research, including: (1) Classroom learning model is flipped with an online digital storytelling method evaluated by 10 experts; (2) Learning support system according to the developed learning model; (3) Management plan of flipped classroom with digital storytelling; (4) System quality assessment form; (5) Learning achievement test; and (6) System user satisfaction assessment form. The samples used in this research were 26 computer studies students from the faculty of science and technology Nakhon Pathom Rajabhat University. The data were analyzed by using mean, standard deviation, and *t*-test statistics. The results of the research found that: (1) The flipped classroom learning model with online digital storytelling was rated by expert assessment as most appropriate, The developed learning model had an efficiency of 87.69/80.26, which was higher than the benchmark set at 80/80; (2) The learners had higher learning achievement after studying than before studying. The learners had significantly higher after school achievement than before at .05 level; and (3) After studying with the classroom learning model, flipped classroom with online digital storytelling, the students' satisfaction was at the highest level of satisfaction.

Introduction

The epidemic situation of the coronavirus 2019 affected education both in terms of school closures as well as to change the way of teaching management by using educational media and technology to manage online teaching and learning Siritarungsri (2020). This

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was so that students can learn from home and teachers can manage teaching and learning, assign assignments, check assignments, measure results and assess students' learning outcomes Boonphak (2020), Rajabhat University Act, B.E. 2547, Chapter 1, General Chapter, Section 8, Item 5, to strengthen the teaching profession produce and develop teachers and educational personnel to have quality and standards that are suitable for high-professional Ministry of Education (2017). From the above-mentioned Act, the Computer Education Department, Faculty of Science and Technology, Nakhon Pathom Rajabhat University has taught the course of administration and Internet services with teaching about management principles and being an internet network service provider. In the course, there will be both theoretical lectures, which are the steps to present content, theory and knowledge to learners and teaching demonstrations that allow learners to practice with real equipment. The learners will develop knowledge and skills gained from practice. In the management of learning with practice with real equipment, there are limitations in learning due to the limited time in teaching practice. Additionally, the condition of the classroom with a large number of students affects the clarity of vision. In learning management, it is necessary to develop a learning model that solves problems and promotes learning as well as produces media that helps in presenting teaching content with a system to present the steps and process of learning management to support learning management for better academic achievement.

Learning achievement is a measure and evaluation of learners' learning. There are many benefits, especially in teaching and learning management, testing and grading. This is a requirement and regulation that educational institutions must follow in order to develop the quality of learners to their full potential. Academic achievement is the ability of learners in various fields which arises from the experience gained from the teaching and learning process. The instructor is the one who studies the measurement and evaluation guidelines as well as creating quality measuring tools (Dechakup & Yindeesuk, 2011). Discussing academic achievement in the book on learner-centered teaching, means that Academic achievement refers to the size of success achieved in the teaching and learning process.

The teaching and learning style of computer education students is usually mainly focused on practice. Teaching and learning management most often takes a lot of time, causing problems in student learning because sometimes during the study period, the theory must be taught before practising. This may result in not enough study time per class. Such affects the study, which is not fully achieved. Sometimes there are special holidays and public holidays that also affect the management of teaching and learning. For this reason, it is seen that learning by using inverted classroom learning with online digital storytelling methods can help solve problems because they design teaching in the form of online theory content where students can learn from outside the classroom.

Learning management style is another important issue that results in learners learning according to the content they want. One of the learning styles that can help with limited time in class is the flipped classroom style which is a way to apply internet technology to enhance learning in the classroom by allowing learners to study content developed by teachers in advance outside of class time and conducting regular classroom activities to enhance interaction with learners. The entire learning process is contrary to what it used to be, with classroom activities such as note-taking being done at home through the materials the teacher has created. And, things that used to be done at home will be done in class.

The development of teaching materials can be done in a variety of ways to match the context of the learners and the course for the most effective learning. The teaching materials that are the introduction of a computer as a tool to create a computer program for students to take to learn on their own and learning include texts, graphics, animations and sounds to attract learners to be more interested. Also, teaching materials must be presented based on the principle of interaction with learners. The knowledge that arises in each frame should arise from the student's direct interaction with the lesson. It should not be presented as a one-way communication. The lessons are presented on one side with the digital storytelling media as the concept of storytelling. It is now being used as a good learning management tool for learners in the 21st century. (Davidson & Porter, 2008) said digital storytelling is a form of presenting content through photographs, works or essays based on past experiences. (Songkram, 2011) also said that Digital storytelling is a short storytelling with digital materials such as still images, audio, and video clips that are used to make up stories from the storyteller's own feelings.

From the background and importance of teaching and learning management above, it can be seen that the

flipped classroom approach helps where there is limited time in class. It also enhances the interaction between teachers and students and increases knowledge for students. In addition, storytelling through digital media is also a suitable method for presenting content or knowledge arising from the teacher's experience to learners. Therefore, the researcher had an inspiration to develop flipped classroom-style learning with an online digital storytelling method for computer studies students to encourage learners to have higher academic achievement and practice results that meet the specified criteria. They can also learn anywhere, anytime, able to meet the needs of today's learning needs.

Literature Review

Flipped Classroom

Flipped classroom model, work that is normally done in class and work that is normally done as homework is flipped or switched. Before coming to class, students read materials and view videos on the topic assigned, and then engage in class in active learning using games, simulations, discussions or experiments with the assistance of the educator Suwarna (2016). Technology can support flipped classrooms, usually via reading or lecture videos and then using class time to do the harder work of assimilating that knowledge, perhaps through problem solving, discussion, or debates (Bergmann & Sams, 2012). Table 1 presents the researcher's review and synthesis of the flipped classroom method.

Digital Storytelling

This is an extension of the actual narrative of storytelling mixed with a technological character, whereby digital media such as digital audio storytelling, digital visual storytelling, and written digital story storytelling are used in order to achieve educational learning objectives interestingly and attractively (Shemy, 2020).

Methodology

The development learning model of flipped classroom with digital storytelling for the Department of Computer Education used a quasi-experimental one-group, pretest-posttest design.

Participants

The population used in the research was 4th year undergraduate students in the field of computer studies, Faculty of Science and Technology, Nakhon Pathom Rajabhat University, who enrolled in semester 1/2021, 3 groups, total 74 students. Samples used in the research were selected from a population of 26 people using a group randomization method (cluster random sampling) from all enrolled students.

Data Collection

Developing flipped classroom learning with online digital storytelling for students in the field of computers is

Table 1 Synthesis of the flipped classroom method

Learning model of flipped classroom					
Sukharee (2021)	Koontha and Iamsam-ang (2019)	Sooksena and Songserm (2018)	Prathumdee and Sonsupap (2021)	Panit (2013)	The researcher
1. Study	1. Prepare	1. Prepare	1. Warm up	1. Clarify the learning subject	1. Prepare and explain
2. Review	2. Import Into the lessons	2. Learning	2. Exploration	2. Self-study	2. Study
3. Practice	3. Clarification	3. Introduction	3. Explanation	3. Conversation with student	3. Knowledge Sharing
4. Discus	4. Practice	4. Practice	4. Elaboration	4. Student discusses or practices	4. Practice
5. Evaluation	5. Evaluate the results	5. Discuss	5. Evaluation	5. Student summarises the collective thoughts	5. Evaluation
		6. Evaluate (in class)			

research according to the research and development model that has been conducted divided into 3 phases as follows:

Phase 1

1. Analysis of problem conditions and research needs. In this stage, the researcher studied the current situation by studying the problems from the papers, report of related research textbooks, analyze key parts that will be used to develop a flipped classroom learning model with an online digital storytelling method including the analysis of characteristics and problems of learners in the field of computer studies as well as content in the course of administration and Internet services that are included in the bachelor of education program in Computer Studies. The contents used in the research consisted of the following topics: (1) installation of equipment related to Internet service; (2) creation of DHCP Server service; (3) creation of web server service; and (4) creation of DNS Server service.

Phase 2

1. Study principles, concepts, and theories. In this stage, the researcher studied the theory and assessed the appropriateness of the proportions of flipped classroom learning. This will involve studying content from home and doing activities in the classroom and studying digital storytelling styles that are suitable for practice content. Then the results of the data analysis were used to determine the learning model as well as specifying the content that will be used in the learning process.

2. Research process design. This research was conducted using the One Group Pretest Posttest Design research model (Gibbon et al., 1987). The test was performed to measure before and after with a single group. The conceptual framework used in research consists of concepts/theories used in research. It consists of: (1) flipped classroom learning; and (2) digital storytelling methods online. The two concepts were developed as a flipped classroom learning model with an online digital storytelling method for computer studies students consisting of: (1) Learning in a flipped classroom style. This is a pre-classroom teaching that presents content in a digital storytelling way; and (2) classroom-style learning, reversed in the classroom that offers online practical teaching. The results obtained consisted of: (1) learning achievement; and (2) student satisfaction.

3. Synthesis of learning styles. The study reviewed all research-related data and synthesized the steps to be used as a reverse classroom learning model according to the conceptual framework. The learning style was then assessed by an expert. A questionnaire was used for the opinions of experts on the appropriateness of the developed conceptual framework as a research tool. Such contained the following details: (1) Step-by-step synthesis of a flipped classroom model; and (2) Synthesize the conceptual framework of a flipped classroom learning model using online digital storytelling for students of computer studies, as in Figure 1, from (Koontha & Iamsam-ang, 2019); Panit (2013); (Prathumdee & Sonsupap , 2021); (Sooksena & Songserm, 2018); and Sukharee (2021) It consists of the following modules: (1)

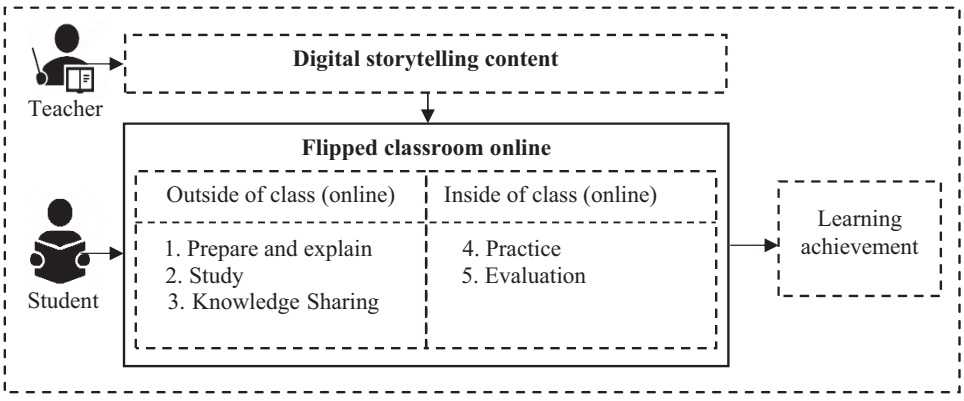

Figure 1 The conceptual model of a Flipped Classroom with Digital Storytelling

Flipped classroom online is a step-by-step module of the online flipped classroom model with a 5-step process as follows: (1.1) Prepare and explain: Teachers prepare learning materials, learning activities and learning algorithms to guide, (1.2) Study: Introducing the learning algorithm. Learners conduct online learning content in accordance with the procedures and methods set forth before entering the class, (1.3) Knowledge Sharing: The instructors answer questions during the learning exchange activities, (1.4) Practice: The instructor assigns students to perform activities and practice. Learners perform activities according to the assigned activity sheet, (1.5) Evaluation: Instructors evaluate the work, the assignments, the learners, create the knowledge of the learners by themselves creatively through various digital media; (2) Digital Storytelling content is a content module in learning management designed and developed using the concept of digital storytelling media development. It tells a story by integrating various forms of digital technology into teaching tools in the classroom, such as images, audio, and video clips accompanying the storyteller's audio narration. It consists of 6 steps as follows: (2.1) Point of view, (2.2) Finding the moment, (2.3) Emotion Content, (2.4) Spoken Narrative & Soundtrack, (2.5) Seeing your story and performance, and (2.6) Sharing your story; (3) Learning Achievement is the success that comes from the learning process; (4) Teacher is responsible for teaching activities according to the reverse classroom learning activity plan, which can separate the teacher's duties outside the classroom and duties in class. The details are as follows: (4.1) Duties outside of class: Teachers make appointments for teaching activities each week, keep track of the progress of the students, answer questions about learning and solve problems when students need help, (4.2) Duties inside of class: Teachers are responsible for teaching activities in the classroom, grouping students, explaining the steps of activities, controlling students' activities, answering students' questions and solving immediate problems; and (5) Students are divided into duties outside the classroom and duties in the class as follows: (5.1) Duties outside of class. Students will study new material each week by having students study the content of the lesson and record the learning results and any doubts about the lesson content to be used in the next step in classroom activities, and (5.2) Class duties. Students conduct group activities, discuss together to help each other solve problems from the given problems, make a record of learning results, do individual exercises with teachers to control and facilitate learning.

4. Design tools used in research. The researcher set the properties and designed the tools according to the objectives. All the tools used included: learning management plan, learning management system design, pre- and post-class test, lesson plan assessment form, content assessment form, system performance assessment form, and student satisfaction assessment form.

5. Develop a learning management, plan achievement measurement form and a rubric evaluation form.

6. System design and development. To support learning management according to the flipped classroom learning model with online digital storytelling. Execute the process of ADDIE MODEL (Thomas et al., 2002) based on the principle of systematic approach, which is generally accepted as being used to design and develop computer lessons very well. There are a total of 5 steps in the process as follows: (1) Analysis. Analyze the key elements that will be developed into a system to support learning management according to the flipped classroom learning model with online digital storytelling. Such consists of analyzing the technology used in the development of the system, setting system properties by dividing the section into the part of the teacher and the part of the learner who can define the learning path, and analyzing the content that will be used to develop media to present a digital storytelling; (2) Design. Design a Flipped classroom model with DS system by defining the context diagram of the system, the system flowchart in the instructor part, as well as designing screens and system interactions for teachers and students and design media for digital storytelling online in the process of presenting images and content used; (3) Development: (3.1) Develop a learning management system based on a flipped classroom model that supports the presentation of content by means of digital storytelling online using PHP, a computer language for developing websites rendered in HTML format, CSS for styling the page display, JavaScript for user interaction with the website by using MySQL, a database management system program that works with a web server (Web Server), and a web browser (Web Browser) that can be used online through the Internet network by uploading to the web hosting (Web Hosting) with the server provider, and (3.2) Develop online digital

storytelling media. Organize the work elements (Layout) by applying the concept of information presentation content outline and various designs to consider the nature of the design and the arrangement of different elements, choosing a style, size, color and font arrangement, and composing the image according to the outline of the content then execute Edited using a video editing program; (4) Implementation. The researcher reversed the learning management system and classroom-style learning materials with the developed online digital storytelling method. Such was then used to experiment with students who have studied before. Test the system to check the accuracy, difficulty, control, and interaction of teaching materials; and (5) Evaluation. Evaluate the learning management system according to the flipped classroom learning model using the system quality assessment form. The results of the expert assessment were at the most appropriate level ($\bar{x}$ = 4.76, *SD* = 0.22). Evaluate flipped classroom learning materials using online digital storytelling, assess content and technical suitability. The results of the expert evaluation revealed that the experts gave the most appropriate overall opinion with a mean score ($\bar{x}$ = 4.68, *SD* = 0.47)

Phase 3

1. Trial. Conducting a request for consent to participate in the research project from the sample group by signing a letter of consent to participate in the research of the research subject. Then take the flipped classroom learning model with an online digital storytelling method that has passed the evaluation to be used to experiment with the sample group according to the steps by having the learners do the test before studying. After that, study according to the developed learning activities. In this activity, continuous behavioral assessments (processes) were assessed over a period of 4 weeks, 4 hours a week. After 4 weeks of study, students are asked to take a post-test as a final assessment of their behavior to determine the effectiveness of the developed learning model. Finding achievement and student satisfaction.

2. Evaluate. Let the sample group study according to the learning pattern for 4 weeks until the content is complete, then take the scores from the test after studying, activities during class or quizzes during class to analyze the statistical data and determine the efficiency of the learning model according to the E1/E2 criteria. Analyzing academic achievement from pre- and post-test scores and student satisfaction.

Data Analysis

1. Develop a learning management plan based on a flipped classroom learning model with an online digital storytelling method. The study management plan is divided into 4 plans according to the specified content, consisting of: (1) Operations installation of equipment related to Internet service; (2) DHCP Server service creation; (3) Web Server service creation; and (4) DNS Server service creation and study management plan evaluation by 5 experts. The results of the expert assessment were at the most appropriate level ($\bar{x}$ = 4.62, *SD* = 0.52)

2. Develop an achievement measure by specifying a multiple choice of 30 items, and then propose 5 experts to assess the consistency between the questions and the objectives. The evaluation results found a consistency index between 0.60–1.00. Take the exam to test the learners who have studied before to: (1) find the test confidence value by using KR-20 with the test confidence value of 0.94; and (2) find the difficulty of the exam.

3. Develop a rubric evaluation by setting the scoring criteria into 5 levels for use in the evaluation of learning activities. Give it to 5 experts to assess the consistency between the question and the objective. The assessment results showed that the consistency index was 1.00.

4. Evaluate the learning management system according to the flipped classroom learning model using the system quality assessment form.

5. Evaluate flipped classroom learning materials using online digital storytelling, assess content and technical suitability. The results of the expert evaluation revealed that the experts gave the most appropriate overall opinion with a mean score ($\bar{x}$ = 4.68, *SD* = 0.47)

The data were analyzed by using mean, standard deviation, and *t*-test statistics.

Results

The data were analyzed by using mean, standard deviation, percentage, and *t*-test statistics.

1. Results of the development of a flipped classroom learning model with an online digital storytelling method for students of computer studies. From the learning style assessment by 10 experts, results are listed in Table 2

Table 2 The result of learning style assessment

The Questions	$\bar{x}$	*SD*
1. Appropriateness of Flipped classroom online modules	4.70	0.48
2. Appropriateness of the Flipped classroom's model	4.80	0.42
3. Appropriateness of digital storytelling content module in content management for learning	4.80	0.42
4. Appropriateness of Learning Achievement results	4.60	0.52
5. Appropriateness of the teacher module	4.70	0.48
6. Appropriateness of student modules	4.70	0.48
7. Appropriateness of the overall conceptual framework	4.50	0.53
8. Appropriateness in applying the conceptual framework in learning management	4.60	0.52
Total	4.68	0.48

According to Table 2, it was found that the learning style assessment was at the most appropriate level, having a score of ($\bar{x}$ = 4.63, *SD* = 0.49). All 10 experts accepted the synthesized conceptual framework.

The flipped classroom learning model with an online digital storytelling method which was developed has an efficacy evaluation as seen in result listed in Table 3. According to Table 3, the results of the flipped classroom learning model with an online digital storytelling method are 87.69/80.26. This meets the required standard at 80/80. Therefore, it was concluded that the developed learning style was effective according to the specified criteria.

3. The learning achievement of pre- and post-learning learners with a flipped classroom learning model with developed online digital storytelling methods, from analyzing the pre-study and post-study scores, (Brahmawong, 2013) is as shown in Table 4.

According to Table 4, it was found that the scores after school ($\bar{x}$ = 24.08, *SD* = 1.87) were significantly higher than the scores before school $\bar{x}$ = 13.54, *SD* = 2.76) at the .05 level.

Table 3 The results of the flipped classroom learning model with an online digital storytelling method

Test score	*n*	Total Score	$\bar{x}$	Effectiveness
Score of mid - test (E1)	26	20	17.54	87.69
Score of post - test (E2)	26	30	24.08	80.26

4. Student satisfaction. After studying with a flipped classroom-style learning model with the developed online digital storytelling method, 26 students were asked to assess their satisfaction. It was found that the students' satisfaction was at the highest level of satisfaction with a score of ($\bar{x}$ = 4.78, *SD* = 0.52).

Results and Discussion

Regarding research on the development of a flipped classroom learning model with an online digital storytelling method for students of computer studies whose objectives are: to develop a flipped classroom learning model with online digital storytelling for students of computer studies, conduct a study on the effectiveness of the developed learning model, compare the learning achievement of the learners before and after learning, and study student satisfaction, after studying with a developed learning style, from the research results, there are issues for discussion according to the following objectives:

1. This research is in a flipped classroom learning model with an online digital storytelling method for computer studies students. There was an assessment of the learning model by 10 experts that it was at the most appropriate level, with a score of ($\bar{x}$ = 4.63, *SD* = 0.49). 10 experts accepted the synthesized conceptual framework. The issues that experts had are as follows: (1) Flipped classroom learning will help manage the limited study

Table 4 The results of comparison of learners' performance before and after receiving treatment

Test score	*n*	Total Score	$\bar{x}$	*SD*	*t*	*p*
Pre-Test	26	30	13.54	2.76	15.99*	.00
Post-Test	26	30	24.08	1.87		

Note: * With statistical significance at the level of .05.

time; (2) Allowing students to learn theories from online digital storytelling media where learners will gain knowledge that is conveyed from the direct experience of the instructor; and (3) Learners will gain knowledge and the experience by doing activities together in the classroom as well as the interaction between the teacher and the learner more in the synthesis of inverted classroom learning patterns by online digital storytelling methods for students in computer studies. The researcher studied the theory and related research to analyse, synthesise, and adapt to the context of the research and complete the process. Therefore, the result of the assessment of the developed learning style is the most appropriate that can be used, which is consistent with the concept of (Bergmann & Sams, 2012), which was written in the book "Flip Your Classroom Reach Every Student in Every Class Every Day" with the concept that Flipped Classroom is to encourage students to develop more knowledge, ideas, skills, thinking processes while in class. It is also consistent with the concept of Panit (2013) that has been written in the book "Teachers for students build classrooms on the way back". As mentioned at one point, it can be concluded that there will be a time in class called "questions and answers," which is very entertaining and valuable.

2. Results of the evaluation of the effectiveness of a flipped classroom learning model with an online digital storytelling method were 87.69/80.26, which is in accordance with the standard set at 80/80. Therefore, it was concluded that the developed learning style was effective and according to the specified criteria. Because the online digital storytelling lesson design is appropriate for the inverted classroom learning style, it is designed appropriately, completely undergoing various screening processes, resulting in effective learning, effective scoring during classes and post-study tests according to the specified criteria. The results are consistent with the research by Siangchin (2020), who conducted research on "The result of using the innovative flipped classroom" to develop skills in performing standard dance moves for students in secondary school year 2, Rattanakosin Sompochbowonniwet Salaya School under the Patronage of the Supreme Patriarch, in which the efficiency of flipped classroom innovation was effective according to the 80/80 criteria. After being tested for efficiency in a group of 30 students, the efficiency value was 83.17/86.75, which met the 80/80 efficiency criteria.

3. The learning achievement of pre- and post-learning learners with a flipped classroom learning model with developed online digital storytelling method. From collecting pre- and post-study scores after school and then analyzing the result, it was found that the scores after school ($\bar{x}$ = 24.08, SD = 1.87) were significantly higher than the scores before school ($\bar{x}$ = 13.54, SD = 2.76) at the .05 level because the process of designing the test is synthesised from the lesson content and brought to experts to check and evaluate at every step. Such was to analyse the quality of the test until all items are complete with the lesson content, resulting in better results. The results are consistent with the research using the flipped classroom learning model of (Srichailard & Srichailard, 2019), who conducted research on "The development of a flipped classroom teaching style with a peer-to-peer learning method combined with project-based learning." The comparison of learning achievement before and after school found that the learners who studied using the teaching style had the learning achievement after school at ($\bar{x}$ = 51.63, SD = 5.61), which was significantly higher than before school ($\bar{x}$ = 33.33, SD = 10.31) at the 0.05 level. This is in accordance with the assumptions set and is consistent with the research by (Seubsom & Meeplat, 2017) doing research on developing flipped classroom learning activities by integrating multimedia technology coursework through Google Classroom, comparing the learning achievement of the sample group by testing to find the difference of the average scores of the pre- and post-study sample used in the inverting classroom learning activities through Google Classroom. It was found that the learning activities in the flipped classroom had a statistically higher effect on learners' learning achievement at the .05 level. This is consistent with the research that used the teaching and learning model of digital storytelling by Sanboonvej (2019), who did research on "Developing a teaching style through digital storytelling to improve English pronunciation and creativity of undergraduate students." In the study regarding the teaching and learning outcomes, it was found that the average English reading aloud score after learning with the teaching style was statistically significantly higher than before at the .05 level.

4. Student satisfaction. After studying with a flipped classroom-style learning model with developed online digital storytelling methods, it was found that the students' satisfaction was at the most satisfied level, with

a score of ($\bar{x}$ = 4.78, *SD* = 0.52). The students' opinions were as follows: (1) They liked the inverted classroom approach where they could spend more time in the classroom doing practical activities; (2) Video-based learning media makes it easy to understand the content that needs to be studied at home well, and they can study as needed because the developed learning style is flexible in learning and increases the channel for learners to learn before they come into practice. And most importantly, you can learn unlimitedly. The results are consistent with Pahea (2013), who said that flipped classrooms help children with different abilities to progress in their studies according to their abilities because you can watch the video by yourself and can stop or rewind as you like. Also, in accordance with Sithsungnoen (2017), flipped classroom teachers act as coaches to assist in the workload of innovation. The teaching materials used for learning are videos which teachers may create by themselves or videos that others have already made.

Conclusion and Recommendation

The flipped classroom-style learning model with an online digital storytelling approach, in the process, is good to manage time in the limited classroom, responds well to the different learning times of each individual, as well as promotes interaction of learners and teachers. It increases learning achievement in terms of knowledge from lessons that the teacher has prepared and learning from the activities in the classroom to the fullest. The requirement to study with the flipped classroom learning model with an online digital storytelling approach is to rely on technology and adequate teaching and learning equipment, such as internet network speed and stability space on the website or server for the maximum benefit to the learners. Therefore, users should analyze the availability of technology together. For the next research extension, the instructor may consider applying it to the theory course to try to measure the learner's academic achievement and to study the teaching method.

Conflict of Interest

The author declares that there is no conflict of interest.

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