
Data Analytics of Online Lessons in Social Studies: Enhancing Teaching and Understanding Among Teachers and Students

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(Received August 15, 2023; Revised September 1, 2023; Accepted September 15, 2023; Available online September 21, 2023)

Abstract

The objectives were to (1) determine the effectiveness of online lessons of Social Studies and Buddhism on Dhamma's teaching regarding Tripitaka for teachers; (2) compare the pre-test and post-test achievements of teachers and primary school 6 (Grade 6) students; 3) examine the satisfaction of teachers and students using online lessons of Social Studies and Buddhism on Dharma's teachings according to the Tripitaka. The samples were 12 teachers, and 30 students studying primary school 6 (Grade 6) at Wat Proifon School. The instruments were online lessons of the Social Studies and Buddhism course on Buddha's Teaching Tripitaka, pre-test and post-test, and the questionnaire of teachers' and students' satisfaction towards studying the online lessons in the Social Studies and Buddhism course on Buddha's teaching regarding the Tripitaka. Statistics used were percentage, mean, standard deviation, and t-test for dependent samples. The findings revealed that the efficiency of online lessons in the Social Studies and Buddhism course on Buddha's teaching regarding Tripitaka was 81.92/80.83 on average based on the criteria. The teachers' learning achievements after using online lessons in the Social studies and Buddhism course on Buddha's teaching regarding the Tripitaka was higher than that of the pre-test 11.40, SD.=1.51, while the average score of the post-test was 18.17, SD.=1.10, and the t-test between the pre-test and post-tests was 6.77, which were significantly distinctive at the level of .05., and the students' learning achievements after using online lessons on the Social studies and Buddhism course on Buddha's teaching regarding the Tripitaka was higher than that of the pre-test: 10.40, SD.=1.61, while the average score of the post-test was 16.17, SD.=1.11, and the t-test between the pre-test and post-tests was 5.77, which were significantly distinctive at the level of .05. Teachers' satisfaction was at high level with an average of 4.47, SD.=.55, and the students' satisfaction gained a very high level with an average of 4.50, SD.=.44.

Keywords: Data Analytics; Online Lessons; Social Studies; Teaching Enhancement; Student Understanding

1. Introduction

In the 21st century, the focus of educational management centers on cultivating essential learning and innovation skills. These encompass critical thinking and problem-solving, creativity and innovation, effective communication, and collaboration. Additionally, there's an emphasis on developing literacy skills, including information literacy, media literacy, technological proficiency, and financial literacy. Life and work skills, such as adaptability, leadership, initiative, productivity, and social competence, are also integral. Furthermore, fostering lifelong learning involves self-management, problem-solving, career development, cross-cultural understanding, proficiency in computing and ICT, teamwork, and leadership. Notably, online media play a crucial role in facilitating learning in today's information-driven society [1].

The ubiquity of information technology has made social media an integral part of contemporary life, encompassing education, work, and leisure activities. Even monks employ social media platforms to disseminate Buddhist teachings, as a vast reservoir of knowledge and theological resources is available online, effectively making the internet the world's largest library. Social media serves as a global meeting point, enabling the widespread and efficient propagation of Buddhism due to its capacity for rapid and extensive connectivity anytime, anywhere. This approach is particularly appealing to young individuals, as many adolescents and teenagers rely on online sources for news and information. Consequently, online media can engage young people, fostering their interest in Buddhism and contributing to its preservation.

The evolution of borderless communication technologies has paved the way for universal connectivity through websites, YouTube, and various social platforms. Educational management has also adapted, creating teaching materials and online classrooms using platforms like Google Classroom. This shift supports students' readiness for learning and offers teachers valuable resources, enabling active participation in online discussions and efficient instructional methods. However, challenges such as limited access to devices and technical issues may impede students' independent study [2].

Utilizing technology and innovative media in educational management serves several critical purposes: enhancing education quality, bolstering a country's competitiveness, supporting sustainable national development, promoting lifelong learning, and establishing an efficient educational management system. This approach aligns with the Ministry of Education's vision of preparing learners for the challenges of the 21st century, fostering their knowledge and values to become globally competent citizens who abide by ethical principles, be it within the context of Buddhism or their respective creeds.

The development of individuals within society is contingent upon their morality, ethics, and knowledge. Various media, including mass media, encourage students to explore and research knowledge independently from a plethora of sources. The educational environment should encourage students to reflect, engage in activities with immediate impact, and derive a sense of accomplishment from organizing events. Utilizing pre-made cartoon lessons is an approach to educational management that prioritizes learners' needs and benefits while accommodating individual differences, thus empowering students to seek knowledge proactively.

Thailand, with Buddhism as its national religion, adheres to the teachings of Buddha, emphasizing virtuous conduct and moral purity. These principles are crucial for peaceful coexistence and ethical behavior within society. The Benchasil Bencha-Dhamma principles within Buddhist dharma aim to equip students with the knowledge, comprehension, and skills needed for ethical decision-making. Moral and ethical education in schools seeks to cultivate students' conscience to align with religious ethical principles, evident in the daily flag-raising ceremony where students pledge to uphold the five precepts and five principles. In today's diverse and competitive society, the importance of applying these principles for problem-solving and ethical living cannot be overstated.

Teaching techniques that address individual differences are instrumental in creating effective learning environments and empowering students to practice independently. Recognizing these challenges, the researcher acknowledges the significance of online social studies and Buddhism lessons for educators. These lessons allow teachers to leverage online teaching resources to enhance students' learning potential while accommodating individual differences. Through this approach, students can submit assignments, take quizzes, and engage in ongoing communication with teachers. When questions arise, students can access these resources via computers, tablets, or smartphones, facilitating effective teaching and learning and reducing disparities among learners. Ultimately, this empowers students to realize their full potential by applying Buddhist principles in their daily lives.

2. Literature Review

2.1. Ability to teach Online Learning in future Social Studies and Buddhism courses on Buddha's Teaching for teachers.

Online learning is widely utilized in universities and in various forms, for example, Web-Based Instruction or WBI. In order to provide students with effective instruction, there must be a good environment which stimulates learner's motivation. It is proposed that online learning must encourage the learners to act by themselves. It needs to be stated, that online learning which connects to other digital media does not provide a complete or total learning experience because it is essentially a presentation of data and additional information. For this reason, learning is sometimes considered by learners as data and information instead of knowledge. This causes misunderstandings and uncertainty for learners, especially when the mode of instruction has changed itself into instruction without instructors. Although there were new media to provide students with modern technology, it seems that students did not know much of the content inside the media they perceived to be online learning raised the following questions: Which learning strategies are to be used

for online learning in accordance with the course instruction? Do students have originality in thinking via online learning? What content is suitable for what age and what grade of learners for online learning?' How might instructors improve learning environments for online learning after pre-test and post-test phases? The researchers, therefore, decided to find out students' self-appraisal for online learning. The results were applied in developing online learning by using psychological principles via multimedia so that learners were able to integrate ideas and build up a body of knowledge by themselves. Moreover, the instructors applied the results in preparing suitable content for online learning so that learners can learn by themselves with the advantage of new technology. Then, it was determined that educational institutions could apply the results of this research in their design approach for online learning which is most suitable for learners and addresses the problems arising from online learning.

2.2. The effectiveness of online lessons of Social Studies and Buddhism on Dhamma's teaching regarding Tripitaka for teachers.

Theoretical Perspectives of Learning Processes: Gagné's theory, constructivist theory, constructionism theory, mental processes, learning by doing, and social context are reviewed in this article. Gagné's theory, constructivism, and constructionism focus on mental process, learning by doing, and social context, but they are all psychological theories that aim to help learners achieve learning objectives effectively and efficiently and fast and stable understanding. In organizing the learning process, educational institutions and agencies concerned shall provide training in the thinking process, management, how to face various situations, and applying knowledge for obviating and solving problems aims to help Thai students compete in the knowledge-based economy.

- 1) Gagné's Theory: Gagné's theory is "conditions of learning". It distinguishes multiple learning levels. Five major learning categories require different internal and external conditions, eight hierarchical levels of intellectual skills, and nine instructional events to design instruction and media selection His famous "Nine Events of Instruction" focus on cognitive constructs and learning categories include verbal knowledge, intellectual skills, cognitive strategies, physical skills, and attitudes. These events are supposed to foster learning and media selection.
- 2) Constructivist Theory: Based on cognition, constructivist theory is a generic education paradigm. Learners pick and transform past and current knowledge into new constructs and decisions, according to constructivism. The educator provides new material through dialogue to match learners' present understanding, foster discovery, and build on previous achievements.
- 3) Constructionism Theory: Based on constructivist learning theory, constructionism. Seymour Papert, a Piaget student, developed constructionism, which states that learning occurs "most felicitously" when constructing a public artifact "whether a sand castle on the beach or a theory of the universe", "Situating Constructionism" in Constructionism. In his articles, Seymour leans toward constructivism, discussing the challenge of communicating a complicated idea when the reader must construct their own interpretation. However, his claim is mostly about procedure. He feels students will be more engaged in studying if they build something to show, critique, and possibly use. Students will face complicated difficulties and work to solve and learn because of that structure. Constructivism and constructionism are confused due to (a) similar-looking words and (b) distinct definitions of construct. Paget discussed how mental constructions are generated, philosophical constructivists discuss how they are unique (noun construction), and Papert simply says that constructing helps build them. Theory, philosophy, method, science, approach, and practice are transitioning from physical (constructionism) to mental (constructivism). "Giving children good things to do so that they can learn by doing much better than they could before" is constructionism. New technologies offer a wealth of activities for kids to learn math in real life.

2.3. Mental Processes

Many experts study mental processes, from how thoughts occur to how behaviorism developed. This system analyzes learning outcomes [3,4]. Instructional design applies to cognitive, behavioral, and attitudinal learning, including cognitive strategies, understanding, cognitivism, situated cognition, and cognitive activity. Mental processes in this instructional design paradigm apply to cognitive, behavioral, and attitudinal learning. As a micro theory, it gives strategies for each instructional event to improve learning. The learning processes define nine cognitive strategies learning theory-related teaching events. The philosophy of instructional design framework begins with "attention," like

cognitive strategies learning theory. The next event, "informing of the objectives," helps focus trainees' "attention" by triggering memory activation of necessary learning links. Detailed examination of the nine instruction incidents. Referring to appropriate social learning theory sections will provide more information [5,6]. Gagné created a nine-step procedure called the events of construction. These explain how an instructional experience affects a learner's thinking process. Interactive content in e-learning courses help maintain learners' attention, as indicated in Gagne's nine events of teaching [7,8].

2.4. The achievements of primary school students via an online lesson

Gagné's nine instruction events [9] instructive even Internal thought process Get attention Stimuli stimulate receptors Inform students of goal Establishes learning expectations; Encourage learning recall Short-term memory retrieval and activation Present the content Selective perception Provide "learning guidance" Long-term semantic memory encoding Elicit practice. Answers questions to improve encoding and verification Provide feedback Correct performance reinforcement and assessment Assess performance Content retrieval and reinforcement as final evaluation Enhance retention and transfer to the job Applying learned expertise to new situation.

2.5. Learning by Doing Approach

Psychology and teaching have accepted learning by doing as the most popular and effective method. These learning processes focus on practical skills for careers. Group technique or technological experience is mentioned. There is also a focus on constructivist learning theory [10,11], ways of doing and thinking [12], and humanism. According to e-learning works well with learning by doing, which builds knowledge from previous experience. Constructivism learning theory, advanced by Dewey, Piaget, and Vygotsky, defines active knowledge construction based on prior experience. Woolfolk says: "Students actively construct their own knowledge: their minds mediate outside input to determine what they acquire. Learning involves active mental activity, not passive consumption of teaching Hoenlein's create goals to help design constructivism in learning. Seven goals are to provide experience with the knowledge construction process, appreciate multiple perspectives, embed learning in realistic and relevant contexts, encourage ownership and voice, embed learning in social experience, encourage multiple modes of representation, and encourage self-awareness.

2.6. Social Context

Experiential learning and instructional design are crucial for fostering knowledge-building and social negotiation in educational development systems. Constructionism, constructivist, and constructionist theories emphasize the importance of a social context for learners to develop their ideas. The curriculum for vocational internet-based training should integrate students and inspire the creation of relevant tools, ensuring engagement and competence. The social instructional design concept prepares students for work and links competence and competency to performance. The Delphi technique can synthesize these theories to create an Internet-based Instructional Design Framework for Vocational Education (IDFVE) model, which focuses on mental processes, learning by doing, and social environment. This approach helps learners reach their goals and understand topics faster and more reliably than traditional learning methods [5].

2.7. Self-Regulation

Zimmerman and Pintrich emphasize the importance of self-determination, which refers to a learner's responsibility for personal processes such as perceptions, planning, operations, goal setting, cognitive development, and learning strategies. Three components are crucial for performance: self-metacognitive strategies, self-management strategies, and self-conceptualization strategies. Factors affecting students' learning capacity include internal and external factors. The research aims to create an Internet-based instructional design framework for vocational education, focusing on self-regulation and cognitive development [13].

2.8. Teacher Education

Teacher Education teaching and learning are based on three theories: mental processes, learning by doing, and social context. These theories are relevant to key ideas and principles, teaching activities/strategies, teaching learning

environments, and teaching learning models. Teacher Education is classified as teaching procedural knowledge, focusing on both theory and practice. Vocational education can start at the secondary or post-secondary level and interact with the apprenticeship system. Sustaining motivation to learn is strongly dependent on the learner's confidence in their potential for learning. Vygotsky's "zone of proximal development" suggests that learners are challenged within close proximity to their current level of development. This leads to increased confidence in achieving learning objectives and faster, more stable understanding. Constructivist theory asserts that meaningful learning occurs within authentic situations with authentic learning tasks, facilitated through social interaction, shared thought, and decision-making. This approach aims to make Thai learners capable of developing themselves and competing in the world's knowledge-based economy [14,15].

3. Methodology

3.1. Conceptual Framework

This study utilized a mixed method to collect quantitative and qualitative data on the effectiveness of online lessons in Social Studies and Buddhism on Dhamma's teaching regarding Tripitaka for teachers. The study used cognitive assessment and situational assessment to measure students' learning achievements and satisfaction with the online lessons. The results showed that both theoretical modules and workshops were effective in enhancing students' understanding of the Tripitaka teaching. The satisfaction level reached an average of 3.50, indicating the effectiveness of the online lessons in enhancing teachers' teaching skills [16].

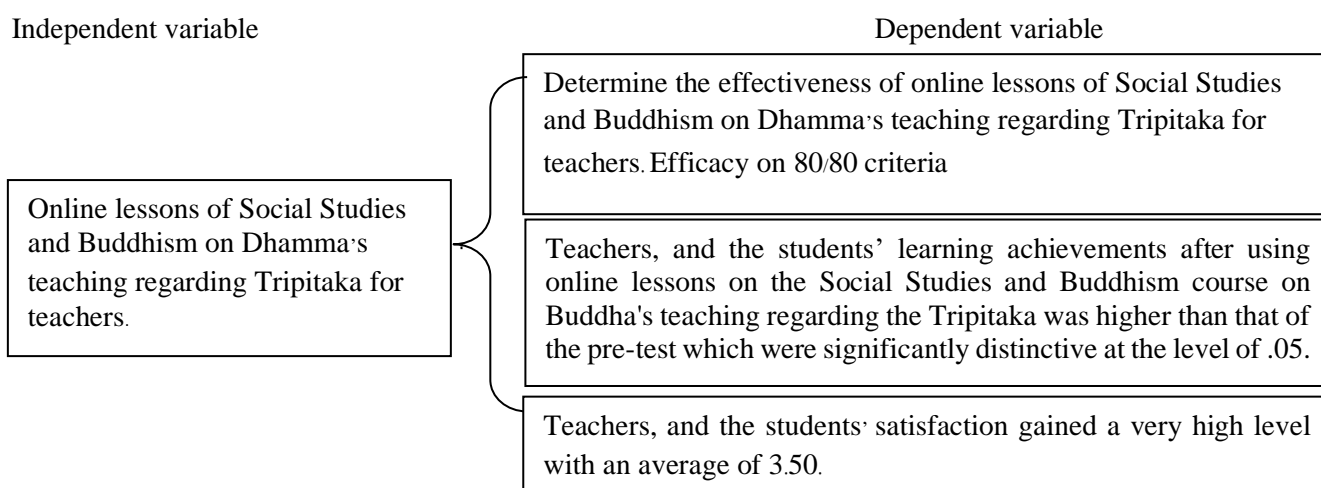


Figure 1. Research Framework

3.2. The objectives of research

The objectives were to 1) determine the effectiveness of online lessons of Social Studies and Buddhism on Dhamma's teaching regarding Tripitaka for teachers; 2) compare the pre-test and post-test achievements of primary school 6 (Grade 6) students; 3) examine the satisfaction of teachers and students using online lessons of Social studies and Buddhism on Dharma's teachings according to the Tripitaka. The samples were 12 teachers, and 30 students studying primary school 6 (Grade 6) at Proifon School.

3.3. Methodology

This research is to study the results of learning from Online lesson in Social Studies and Buddhism on the subject of Dharma teachings according to the Tipitaka for teachers. The researcher conducted the research in the following order: (1) Research pattern, (2) Population and sample, (3) Research tools, (4) Data Collection, (5) Data analysis, and the statistics used [17].

3.4. Research pattern.

The research in question follows an experimental and developmental pattern, reflecting its nature as an experimental and developmental research study. The specific research design employed is known as The One Group Pretest-Posttest Design, as outlined by reference [18]. In this pattern, the researcher initially administered a pretest to the single group involved in the study, which in this case, would be the teachers and students from the primary school. This pretest served as a baseline measurement to assess their initial knowledge, skills, or satisfaction levels related to the online lessons in Social Studies and Buddhism on Dharma's teachings concerning the Tripitaka. Following the pretest, the experimental intervention, which likely involved the implementation of online lessons, was introduced. Subsequently, a posttest was administered to the same group to gauge the impact of the intervention. The comparison of pretest and posttest results allowed for an evaluation of the effectiveness of the online lessons on Dharma's teachings and Tripitaka understanding among the participants, thereby contributing valuable insights to the field of education and instructional design. This research pattern, which combines experimental and developmental aspects, offers a systematic approach to assess the intervention's efficacy in improving the participants' knowledge, skills, and satisfaction levels.

3.5. Population and sample

The population used in this research are Prathomsuksa 6 students studying in Prathumthani School. There are 30 students in schools under the Pathum Thani Educational Service Area Office 2, Pathum Thani Province, totaling 30 students. Wat Proifon School 10 students, Wat Charoen Boon School 10 students, Wat Chaeng Lam Hin School 10 students. The researcher was selected by purposive sampling. This is because it is a network of schools in the Education Quality Development and Local Development Group under the Pathum Thani Educational Service Area Office 2.

3.6. Research instruments

A study of the results obtained from using online lessons in social studies and Buddhism on the subject of Dharma teachings according to the Tipitaka for teachers. The researcher has defined the tools used in the research. The tools used in this research study are as follows:

- 1) Online lessons in social studies and Buddhism on the subject of Dharma teachings according to Scriptures for teachers

The pre-production process involves considering the principles of teachings according to the Tripitaka, which includes the four Sangahavatta, four Itthibath, and four Benjasali Benjadhama, to be incorporated into online lessons for social studies and Buddhism. The curriculum aims to provide students with knowledge and understanding of principles for living with diligence and enable them to apply these principles in their daily lives. The content analysis is done according to the Core Curriculum of Basic Education, B.E. 2551, and the characteristics of students are studied. Software tools used in the preparation process include Adobe Illustrator, Adobe Photoshop, Web data reader, postal programs, and computer conferencing programs. Content is designed and developed for teaching online lessons, and assessment of student learning is conducted. The online lesson pages are designed, with detailed information and pictures provided. The content is then organized and improved, and the completed online course material is tested with the target group. The assessment process involves designing quality assessments for content professionals, media, and the target audience, and evaluating the quality of online teaching aids. The Dharma principles for living with perseverance are also addressed for teachers.

- 2) The pre-study and post-study achievement form is used as a measure of achievement from the use of online lessons in social studies and Buddhism on the principles of teachings according to the Tripitaka.

This study measures prior knowledge and achievement after studying using a Boontham Kitpreedasuet and Angkhana Saiyot test. The 60-item 4-choice test evaluates behavioral goals. Pre-learning and post-study achievement tests. The test's compliance index is .73-.94. A conformance index score of +1 indicates consistency with the intended content, 0 indicates doubt, and -1 indicates non-compliance. Experts assess content validity. The conformance index must be .50 or above. The test has a discriminating power of .25-1.00, and Kuder Richardson's KR-20 formula was used to analyze all learning outcomes' confidence values. The approved confidence value was .80 or higher. The 20-item pre- and post-

study exam of online social studies and Buddhism classes on Tipitaka dharma teachings for teachers has a confidence value of .91. A satisfaction questionnaire was devised to assess grade 6 students' satisfaction with online social studies and Buddhism lessons on Tipitaka Dharma teachings. The questionnaire was designed by analyzing satisfaction questionnaire principles from documents and textbooks and then having specialists review the questions. The acceptable conformance index in this study was .50 or higher. An opinion questionnaire was designed for specialists on online social studies and Buddhism lessons on Tipitaka Dharma teachings. Questionnaires had conformance indexes between .73 and .94. These findings can inform future research. A Likert [6] questionnaire was devised to analyze experts' thoughts on online social studies and Buddhism based on Tripitaka teaching principles. The questionnaire contained five levels: 5 for the highest opinion, 4 for high, 3 for moderate, 2 for low, and 1 for lowest. Likert criteria were used to examine an educational textbook questionnaire. An actual sample of 8 people tested the satisfaction questionnaire. Guidelines and an outline were researched to create a student manual for online social studies and Buddhism lessons on Dharma teachings according to the Tipitaka. The layout of the document includes student goals and benefits for specialists to examine. The advisor then approved the entire guidebook. The student guidebook for online social studies and Buddhism lessons on Tipitaka Dharma teachings was also tested for fuel ability. The researchers will provide the entire guidebook to specialists for feedback and implementation.

3.7. Conducting trials

This study measures prior knowledge and achievement after studying using a Boontham Kitpreedasuet and Angkhana Saiyot test. The 60-item 4-choice test evaluates behavioral goals. Pre-learning and post-study achievement tests. The test's compliance index is .73–.94. A conformance index score of +1 indicates consistency with the intended content, 0 indicates doubt, and -1 indicates non-compliance. Experts assess content validity. The conformance index must be .50 or above. The test has a discriminating power of .25–1.00, and Kuder Richardson's KR-20 formula was used to analyze all learning outcomes' confidence values. The approved confidence value was .80 or higher. The 20-item pre- and post-study exam of online social studies and Buddhism classes on Tipitaka dharma teachings for teachers has a confidence value of .91. A satisfaction questionnaire was devised to assess grade 6 students' satisfaction with online social studies and Buddhism lessons on Tipitaka Dharma teachings. The questionnaire was designed by analyzing satisfaction questionnaire principles from documents and textbooks and then having specialists review the questions. The acceptable conformance index in this study was .50 or higher. An opinion questionnaire was designed for specialists on online social studies and Buddhism lessons on Tipitaka Dharma teachings. Questionnaires had conformance indexes between .73 and .94. These findings can inform future research. A Likert questionnaire was devised to analyze experts' thoughts on online social studies and Buddhism based on Tripitaka teaching principles. The questionnaire contained five levels: 5 for the highest opinion, 4 for high, 3 for moderate, 2 for low, and 1 for lowest. Likert criteria were used to examine an educational textbook questionnaire. An actual sample of 8 people tested the satisfaction questionnaire. Guidelines and an outline were researched to create a student manual for online social studies and Buddhism lessons on Dharma teachings according to the Tipitaka. The layout of the document includes student goals and benefits for specialists to examine [19]. The advisor then approved the entire guidebook. The student guidebook for online social studies and Buddhism lessons on Tipitaka Dharma teachings was also tested for fuel ability. The researchers will provide the entire guidebook to specialists for feedback and implementation.

3.8. Instruments

This research measures background knowledge and achievement after studying online social studies and Buddhism lectures based on the Tripitaka Dharma. A test is created by examining test design documents, generating a post-study achievement measure, and having experts assess it. The conformance index scores +1 for consistency, 0 for uncertainty, and -1 for non-congruence to determine content validity. This study's questionnaire has a .73–.94 compliance index. Using the KR-20 formula, experts assessed content validity, difficulty (p), and discriminating power (r). Accepted test had .25–1.00 discriminating power. With a range of .80 or greater, Kuder Richardson's KR-20 algorithm examined all learning outcomes' confidence ratings. Grade 6 students' satisfaction with online social studies and Buddhism classes on Tripitaka Dharma teachings was assessed using a satisfaction questionnaire. The acceptable conformance index was .50+. For experts on online social studies and Buddhism lessons on Tipitaka Dharma teachings, an opinion

questionnaire was established. Studying self-learning theories, concepts, and principles, assessing components and procedures, and generating surveys were the steps. A 5-level evaluation scale questionnaire was chosen and improved by three educational technology or information technology professionals. The questionnaires used had conformance index values between .73 and .94, which was satisfactory. Future study can leverage these findings to improve online social studies and Buddhism lectures based on the Tripitaka Dharma. Experts' evaluations on online social studies and Buddhism lessons on Tripitaka teaching principles were assessed using a Likert scale. Five levels represented high, four moderate, two low, and one lowest in the questionnaire. Experts in education technology reviewed the questionnaire and three were chosen to fit the subject. The satisfaction survey included 8 genuine people. To produce the student manual for online social studies and Buddhism lessons on Tripitaka Dharma teachings, guidelines and an outline were researched. Online lesson objectives, benefits, and usage instructions were in the guidebook. After preparing and developing the handbook, specialists reviewed it and the advisor approved its execution. The manual's viability was also assessed so researchers could present it to specialists to evaluate and apply it.

Questionnaire I: After semi-structure questionnaires brainstorming of experts evaluated their ideas on Gagné's theory, constructivism, and constructionism for an instructional design approach for self-regulated, online vocational learning. It required leveraging content validity to synthesize semi-structured interview data to create questionnaire I. The study had four parts: principles, activities/strategies, environments, and models based on Gagné's theory, constructivism, and constructionism. The focus was on mental processes, learning by doing, and social context. Questionnaire I evaluated 17 experts on Gagné's theory, constructivism, and constructionism using a five-point Likert scale (1= strongly disagree, 2= disagree, 3 = neutral, 4 = moderately agree, 5 = strongly agree). The questionnaire involved an instructional design model for self-regulated, online vocational learning's). Questionnaire II: After questionnaire I was returned, the responses were synthesized and produced using a diagram chart and divided into similarities and differences. shows in Questionnaire II's five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = somewhat agree, 5 = strongly agree). The third round was with experts. Questionnaire III: After questionnaire II was returned, the results were recognized, sorted, and condensed into significant themes and proposals for all experts to analyze and agree on for the fourth round. 17 experts utilized Questionnaire III to check content validity using 'yes', 'no', or 'unsure'. Chapter 4, table 4.5, and appendix E contain questionnaire III.

3.9. Delphi Technique

First Round: The researcher conducted a brainstorming session on Gagné's theory, constructivism, and constructionism, analyzing mental processes and social context. The results were used for semi-structured interviews, with a questionnaire sent to 17 experts. The responses were categorized, synthesized, and developed into Questionnaire I. Second Round: Likert five-rating scale evaluation of experts' ideas on online learning at vocational level involved using Questionnaire I for management of constructivism and constructionism in self-regulated online learning. Third Round: The re-evaluation stage examined questionnaire I results, emphasizing Gagné's theory, constructivism, and constructionism principles, teaching-learning activities, and models. 17 experts had commonalities, but variances showed the reverse. Questionnaire II was a five-point Likert scale for the third round. Fourth Round: By this round, the feasible ideas had been identified, resolved and reported. The experts acknowledged all the group's opinions with the ideas or strategies and details of implementation [20,21].

3.10. Data collection

This survey measures background knowledge and achievement after studying online social studies and Buddhism lectures based on the Tripitaka Dharma. The test design process entails examining test creation documents, generating a post-study achievement measure, and reviewing the exam with specialists. Conformity index values indicate content validity: +1 for consistency, 0 for uncertainty, and -1 for non-congruence. The study questionnaire had a compliance index of .73–.94. Experts assessed content validity using the KR-20 formula, determining difficulty (p) and discriminating power (r). The acceptable test had .25–1.00 discriminating power. Kuder Richardson's KR-20 method was used to examine all learning outcomes' confidence values, which were .80 or above. The satisfaction questionnaire was designed to evaluate grade 6 students' satisfaction with online social studies and Buddhism lessons on Tripitaka Dharma teachings. The conformance index must be .50 or above. A Tipitaka-based Dharma teachings opinion

questionnaire was prepared for professionals in online social studies and Buddhism lectures. The procedure involved examining self-learning theories, concepts, and principles research papers, assessing components and procedures, and developing surveys. Three educational technology or information technology specialists selected and improved a 5-level evaluation scale questionnaire.

Conformity index scores of .50 or greater were acceptable, with questionnaires averaging .73–.94. These findings can be used in future study to improve online social studies and Buddhism lectures based on the Tripitaka Dharma. A Likert-based questionnaire was used to analyze experts' thoughts on online social studies and Buddhism classes on Tripitaka teaching principles. Five levels represented the highest, four moderate, two low, and one lowest on the questionnaire. Three education technology specialists were considered to customize the questionnaire to match the subject. The satisfaction questionnaire was given to 8 genuine persons. Guidelines and an outline were used to create the student manual for online social studies and Buddhism lessons on Tripitaka Dharma teachings. The guidebook provided online course objectives, benefits, and usage instructions. The manual was then produced, reviewed by professionals, and executed with the advisor's agreement. The researchers also assessed the manual's viability so they could present it to specialists to evaluate and apply it. The data were collected using the Delphi technique. There were four rounds for the data collection as follows:

1) First Round: Brainstorming

The re-evaluation stage analyzed questionnaire I results, focusing on principles, teaching-learning activities, and models from Gagné's theory, constructivism, and constructionism. Results indicated similarities among 17 experts, while differences indicated the opposite. Questionnaire II was developed using a five-point Likert scale for the third round.

2) Second Round: Evaluation of the Experts' Ideas

The study utilized the Delphi technique to evaluate the ideas of a Technology Program in Industrial Education. The researcher connected with 17 qualified experts via phone and invited them to participate. The questionnaire II was administered to all experts, and the results were analyzed using the Likert five-rating scale. The study aimed to understand the similarities and differences between the three psychology theories: Gagné's theory, constructivism, and constructionism. The findings were used to synthesize the learning process theories for self-regulated online learning in vocational education.

3) Third Round: Re-Evaluation

In the third round, 17 experts responded to questionnaire III, selecting items from Questionnaire II. The findings were pooled as similarities or differences, and the synthesis was used to develop Questionnaire III. Appointments were made with all qualified experts, and the questionnaire was handed out at appointments. Three experts wrote comments, while five gave opinions while the researcher made notes. Nine experts preferred to fill out the questionnaire by post, and the framework for an instructional model of learning process theories for self-regulated online learning in vocational education was developed.

4) Fourth Round: Solution-Report

In the fourth phase of the study, experts reached a consensus and generated a report once viable ideas had been pinpointed. Additionally, they acknowledged all input from the group, including ideas, strategies, and implementation details. Statistical analysis involved an initial examination of the data obtained from experts and instructors. The survey employed a five-point Likert-type scale, and data collection was accomplished through questionnaires. These questionnaires were subsequently analyzed to derive results. The section containing selection items was scrutinized using frequency and percentage analyses. The section featuring five-point scales was assessed using mean (M), standard deviation (SD), and correlation. To gauge consensus among the 17 experts, the researcher examined the data through mode, median, and interquartile range, with specific criteria: the median value should not fall below 3.50, the absolute difference between the median and mode should not exceed 1.00, and the interquartile range ($IQ_3 - IQ_1$) should not exceed 1.5 ($IQR < 0.50 = \text{congruent}$; $1.00 \geq IQR \geq 1.00 = \text{incongruent}$). The mean and level of experts' opinions on selected psychology theories were also assessed. The levels for the standard deviation, a measure of data dispersion, were categorized as follows: 0.000-0.999 indicating less dispersed data and more than 1.000 indicating

more dispersed data. Qualitative data gathered from interviews and observations encompassed experts' opinions on selected psychology theories, qualification requirements, training approaches, and assessments. Similar data points were condensed through keyword analysis.

In Phase II, titled "Identification of an Instructional Model of Learning Process Theories for Self-Regulated Online Learning in Vocational Education," the participants consisted of 100 instructors selected via simple random sampling. These instructors had experience in developing electronic media, such as e-books, e-learning, web-based instruction (WBI), and computer-assisted instruction (CAI) in the fields of electrical engineering, electronics, civil engineering, and mechanics within various technical education faculties in Thai universities.

Upon receiving questionnaire III, which encompassed principles, teaching-learning activity strategies, teaching-learning environments, and stages of instructional sequences derived from Gagné's theory, constructivism, and constructionism, responses were categorized into major themes, and expert suggestions were transformed into Questionnaire IV. Questionnaire IV formed the basis for developing an instructional model for learning process theories in self-regulated online vocational education. This questionnaire focused on instructors' opinions regarding the relevance of employing electronic media for instructional models based on learning process theories in self-regulated online vocational education. The questionnaire covered principles, teaching-learning environments, teaching-learning activities strategies, and teaching-learning models.

The survey and participatory observations were used to identify an instructional model for learning process theories in self-regulated online vocational education. This involved the researcher contacting ten qualified universities to select 100 instructors who had experience in developing electronic media. These instructors filled out Questionnaire IV either by post or in-person. Following the completion of Questionnaire IV, the researcher developed an instructional model for learning process theories in self-regulated online vocational education.

Statistical analysis for this phase entailed evaluating the data from 100 instructors who identified the instructional model. The analysis was based on the responses to Questionnaire IV, utilizing frequency and percentage assessments.

4. FINDINGS

Plash I: Result of the effectiveness of online lessons of Social Studies and Buddhism on Dhamma's teaching regarding Tripitaka for teachers was 81.92/80.83 on average based on the criteria; the samples were 12 teachers, and 30 students studying primary school 6 (Grade 6) at Wat Proifon School in the second semester of the academic year 2022. The instruments were online lessons of the Social Studies and Buddhism course on Buddha's Teaching Tripitaka, pre-test and post-test, and the questionnaire of teachers' and students' satisfaction towards studying the online lessons in the Social Studies and Buddhism course on Buddha's teaching regarding the Tripitaka. Statistics used were percentage, mean, standard deviation, and t-test for dependent samples. The findings revealed that the efficiency of online lessons in the Social Studies and Buddhism course on Buddha's teaching regarding Tripitaka.

Table.1. Effectiveness of Online Social Studies and Buddhism Lessons

Total score list	Scores	Mean	Percentage	Criteria standard.	E1/ E2
Grades during class	50	41.20	81.92	80	81.92
Test scores after school	20	16.27	80.83	80	80.83

Using the application of teaching activities according to online lessons of Social Studies and Buddhism on Dhamma's teaching regarding Tripitaka for teachers and taking the test after class teachers have higher grade point averages. The mean score was 16.27; the SD. The value was 1.48. The online lessons on the Social Studies and Buddhism course on Buddha's teaching regarding the Tripitaka was the effectiveness of efficacy on 80/80 criteria.

Plash II: Result of the compare the pre-test and post-test achievements of teachers

Table. 2. Achievements for Teachers

Test	Scores Full	Scores	SD.	t	Sig.(2-tailed)
Pretest	20	11.40	1.51	6.77	.05
Posttest	20	18.17	1.10		

The compare the pre-test and post-test achievements of teachers; the teachers’ learning achievements after using online lessons on the Social Studies and Buddhism course on Buddha's teaching regarding the Tripitaka was higher than that of the pre-test: 11.40, SD.=1.51, while the average score of the post-test was 18.17, SD. =1.10, and the t-test between the pre-test and post-tests was 6.77, which were significantly distinctive at the level of .05., The teachers’ learning achievements after using online lessons on the Social studies and Buddhism course on Buddha's teaching regarding the Tripitaka was the effectiveness.

Table. 3. Student Achievements

Test	Scores Full	Scores	SD.	t	Sig.(2-tailed)
Pretest	20	10.40	1.61	5.77	.05
Posttest	20	16.17	1.11		

The compare the pre-test and post-test achievements of primary school 6 (Grade 6) students; examine the satisfaction of teachers and students using online lessons of Social Studies and Buddhism on Dharma’s teachings according to the Tripitaka. the students learning achievements after using online lessons on the Social Studies and Buddhism course on Buddha's teaching regarding the Tripitaka was higher than that of the pre-test: 10.40, SD.=1.61, while the average score of the post-test was 16.17, SD. =1.11, and the t-test between the pre-test and post-tests was 5.77, which were significantly distinctive at the level of .05.

Plash III: Result of teachers and students' Satisfaction

- 1) Satisfaction of teachers towards the teaching activity application according to online lessons of Social studies and Buddhism on Dhamma’s teaching regarding Tripitaka for teachers. Teachers totaled 12 people Overall, with the highest satisfaction in helping teachers study content anywhere, anytime with an average of 4.70, and did not find the item that teachers had the lowest level of satisfaction. Teachers' satisfaction was high, with an average of 4.47, SD.was 0.55, and a high level of satisfaction, with an overall average of 4.51. Assessment results of teacher satisfaction with the teaching activity application according to online lessons of Social Studies and Buddhism on Dhamma’s teaching regarding Tripitaka for teachers.
- 2) Students' satisfaction with the teaching activity application according to online lessons of Social Studies and Buddhism on Dhamma’s teaching regarding Tripitaka for students. Students total 30 people. Overall, there was a high level of satisfaction with an overall average of 4.51, with the highest satisfaction in helping teachers study content anywhere, anytime with an average of 4.50, and did not find the item that students had the lowest level of satisfaction.

5. Conclusions and Evaluation

Online lessons on social studies and Buddhism on teaching Dharma about scriptures for teachers using the GCC model comprise three theories: Gagne's Constructivism and Constructionism. These theories aim to enhance the thinking characteristics of learners. Foster interest by informing students about expected learning outcomes and creating exciting conditions. Provides valuable tips to learn, find answers, and adjust concepts. Find their ideas and abilities to pass on their knowledge. Developing online lessons involves analyzing learning needs and goals, developing learning materials and activities, and assessing teaching and learning activities. All learner's Online lessons should promote self-discovery learning (SDL) and develop and explore the effectiveness of the application of teaching activities with online lessons.

To compare the learning achievements of teachers with the application of teaching activities and to find out the student's satisfaction with the application of teaching activities according to the curriculum. Social Studies and Buddhist online lessons on Dharma teaching on the Tripitaka emphasize the effectiveness of the application of teaching activities, which emphasize the importance of teaching activities that reduce illusion and individual differences and can make teachers and students access Dhamma thoroughly without limitation of place or time. Lessons can be accessed anywhere, anytime [23].

References

- [1] W. Zhang *et al.*, "The impact of career competence on career sustainability among Chinese expatriate managers amid digital transformation in Vietnam: The Role of Lifelong Learning," *Frontiers in Psychology*, vol. 13, no. 2022, p. 791636, 2022. doi:10.3389/fpsyg.2022.791636
- [2] Z. Abidin and T. M. Saputro, "Google classroom as a mathematics learning space: Potentials and challenges," *Journal of Physics: Conference Series*, vol. 1567, no. 2, p. 022094, 2020. doi:10.1088/1742-6596/1567/2/022094
- [3] Sangsawang, T., K. Jitgarun, and P. Kaikkomol. "Students Self Appraisal for online Training." In *ASIA Pacific Educational Research Association International Conference*, vol. 1, no.1, pp. 1-5, 2006.
- [4] Sangsawang, T., K. Jitgarun, and P. Kaikkomol. "Comparison of Selected Psychology Theories as in Gagne's, Constructivism, and Constructionism." In *The 4th international conference on developing real-life learning experiences: education reform through Performance-Based Learning*, vol.1, no.1, pp. 327-328. 2006.
- [5] T. Sangsawang, K. Jitgarun, and P. Kaikkomol, "An internet based Instructional Design Framework for vocational education," *International Journal of Soft Computing*, vol. 6, no. 4, pp. 119–127, 2011. doi:10.3923/ijscmp.2011.119.127
- [6] R. Likert, in *A technique for the measurement of attitudes*, vol. 22, New York, New York State: Archives of Psychology, Columbia University, 1987, pp. 1–55
- [7] K. Mano, et. al, "Developing educational applications with KWL PLUS teaching techniques in Thai language Subject: Reading Comprehension Affects Analytical Reading Ability of Grade 3 Students.," thesis, 2021.
- [8] T. Sangsawang, "Instructional Design Framework for Educational Media," *Procedia - Social and Behavioral Sciences*, vol. 176, pp. 65–80, 2015. doi:10.1016/j.sbspro.2015.01.445
- [9] U. Sirisukphoka, and S. Krutjon, "Developing a mobile application to enhance English aloud reading skills for grade 3 students who study with a reverse classroom learning technique," *Journal of Industrial Education King Mongkut, North Bangkok*, vol. 10, no. 2, pp. 227-236, 2019.
- [10] P. Sueapradit, "Using Su Chi Pu Li to promote analytical thinking in Thai language subject 5 Literature and Literature for students in grade 5.," thesis, 2018
- [11] R. Surathamjanya, "The results of using an application for teaching English vocabulary on an English subject tablet. For elementary school students under the Ratchaburi Primary Educational Service Area Office 2.," thesis, 2015.
- [12] R. Phuchada and S. Suramane, "Developing applications for learning on tablets about components of information systems for Primary 4(Grade 4)," thesis, *Academic Journal of Information Technology Applications*, Talat, 2015.
- [13] R. Vortman, M. C. Wendler, and S. McPherson, "A Delphi technique study to understand nurses' knowledge and concerns regarding surgical smoke," *Perioperative Care and Operating Room Management*, vol. 24, no. 1, p. 100193, 2021. doi:10.1016/j.pcorm.2021.100193
- [14] C.-W. Kao, H.-H. Chen, S.-H. Wu, B.-J. Hwang, and H.-S. Lai, "An adaptive gaze tracking system in the diverse environment," *IJIS: International Journal of Informatics and Information Systems*, vol. 5, no. 1, pp. 47–55, 2022. doi:10.47738/ijis.v5i1.124
- [15] T. Hariguna, "An Empirical Study to Understanding Students Continuance Intention Use of Multimedia Online Learning", *Int. J. Appl. Inf. Manag.*, vol. 1, no. 2, pp. 42–52, Jul. 2021.
- [16] A. Widiyanto, A. N. Prabowo, N. Nuryanto, M. I. rham N. Amarullah, and A. S. Nuruzzaman, "The effect of e-learning as one of the information technology-based learning media on student learning motivation," *IJIS: International Journal of Informatics and Information Systems*, vol. 4, no. 2, pp. 123–129, 2021. doi:10.47738/ijis.v4i2.108
- [17] D. Oteng, J. Zuo, and E. Sharifi, "An expert-based evaluation on end-of-life solar photovoltaic management: An application of Fuzzy Delphi technique," *Sustainable Horizons*, vol. 4, no. 1, p. 100036, 2022. doi:10.1016/j.horiz.2022.100036
- [18] Y. Zhu, C. Yang, J. Zhang, and B. Chen, "Developing an empathy educational model (EEM) for undergraduate nursing students: A delphi technique," *Nurse Education in Practice*, vol. 50, no. 1, p. 102922, 2021. doi:10.1016/j.nepr.2020.102922
- [19] M. Jaam, A. Awaisi, A. El-Awaisi, D. Stewart, and M. S. El Hajj, "Use of the delphi technique in pharmacy practice research," *Research in Social and Administrative Pharmacy*, vol. 18, no. 1, pp. 2237–2248, 2022. doi:10.1016/j.sapharm.2021.06.028
- [20] M. Hori, "Study of Career Education for Women: Development of Global Human Resources", *Int. J. Appl. Inf. Manag.*, vol. 1, no. 2, pp. 53–62, Jul. 2021.
- [21] Y. Dragostinov *et al.*, "Preliminary psychometric scale development using the mixed methods Delphi Technique," *Methods in Psychology*, vol. 7, no. 1, p. 100103, 2022. doi:10.1016/j.metip.2022.100103

- [22] A. J. A. Meershoek *et al.*, “Clinical response to procedural stroke following carotid endarterectomy: A delphi consensus study,” *European Journal of Vascular and Endovascular Surgery*, vol. 62, no. 3, pp. 350–357, 2021. doi:10.1016/j.ejvs.2021.05.033
- [23] T. Sangsawang, “An instructional design for online learning in vocational education according to a self-regulated learning framework for problem solving during the COVID-19 crisis,” *Indonesian Journal of Science and Technology*, vol. 5, no. 2, pp. 283–198, 2020. doi:10.17509/ijost.v5i2.24702