



THE DEVELOPMENT OF BOARD GAME LEARNING MEDIA IN SOCIAL STUDIES TO ENHANCE ANALYTICAL THINKING SKILLS AND LEARNING ENGAGEMENT OF PRE-SERVICE SOCIAL STUDIES TEACHERS*

การพัฒนาสื่อการเรียนรู้บอร์ดเกมสังคมศึกษาเพื่อเสริมสร้างทักษะการคิดวิเคราะห์และ
ความยึดมั่นผูกพันในการเรียนของนักศึกษาครุสังคมศึกษา



Pichart Kaewpuang, Bordin Phayaphrom

พิชาติ แก้วพวง, บดินทร์ พญาพรหม

European International University

มหาวิทยาลัยนานาชาติแห่งยุโรป

Corresponding Author E-mail: pichartkwpng10@gmail.com

Abstract

This research article has objectives 1. Develop board game learning media in social studies to enhance analytical thinking skills and learning engagement of pre-service social studies teachers, 2. Evaluate the effectiveness of board game learning media in social studies on analytical thinking skills and learning engagement of pre-service social studies teachers. The samples used in the research were 30 pre-service social studies teachers who studied in social studies program, College of Teacher Education, Phranakhon Rajabhat University.

The instruments used in the research consisted of lesson plans using board game learning media; an analytical thinking skill test, and a learning engagement evaluation. The experiment was conducted for 8 weeks. The data were analyzed by arithmetic mean, standard deviation, and t-test.

The research results revealed that: 1. Board game learning media in social studies consisted of six key components: 1. board game title, 2. objectives, 3. materials and objects, 4. rules of playing the game, 5. players, and 6. Stories. The quality of board game learning media in social studies was at the highest level, and had an efficiency (E1/E2) of 81.11/83.44, which followed criteria 80/80;

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2. Pre-service social studies teachers who learned board game learning media in social studies had higher analytical thinking skills and learning engagement than pre-experiment at a statistically significant level of 0.05.

Keywords: Board Game Learning Media; Social Studies; Analytical Thinking Skills; Learning Engagement

บทคัดย่อ

บทความวิจัยนี้มีวัตถุประสงค์ 1. พัฒนาสื่อการเรียนรู้บอร์ดเกมสังคมศึกษาเพื่อเสริมสร้างทักษะการคิดวิเคราะห์และความยึดมั่นผูกพันในการเรียนของนักศึกษาครุสังคมศึกษา 2. ประเมินประสิทธิภาพของสื่อการเรียนรู้บอร์ดเกมสังคมศึกษาที่มีต่อทักษะการคิดวิเคราะห์และความยึดมั่นผูกพันในการเรียนของนักศึกษาครุสังคมศึกษา กลุ่มตัวอย่างที่ใช้ในการวิจัย คือ นักศึกษาครุสาขาวิชาสังคมศึกษา จำนวน 30 คน วิทยาลัยการฝึกหัดครุ มหาวิทยาลัยราชภัฏพระนคร เครื่องมือที่ใช้ในการวิจัยประกอบด้วยแผนการจัดการเรียนรู้โดยใช้สื่อการเรียนรู้บอร์ดเกมสังคมศึกษา แบบทดสอบวัดทักษะการคิดวิเคราะห์ และแบบประเมินความยึดมั่นผูกพันในการเรียน ใช้เวลาในการทดลอง 8 สัปดาห์ วิเคราะห์ข้อมูลโดยการหาค่าเฉลี่ย (Mean) ค่าส่วนเบี่ยงเบนมาตรฐาน (Standard Deviation) และสถิติทดสอบค่าที่ (t-test)

ผลการวิจัยพบว่า 1. สื่อการเรียนรู้บอร์ดเกมสังคมศึกษาประกอบด้วย 6 องค์ประกอบสำคัญ ได้แก่ 1. ชื่อบอร์ดเกม 2. วัตถุประสงค์ 3. วัสดุและอุปกรณ์ 4. กติกาการเล่นเกม 5. ผู้เล่น และ 6. เรื่องราว คุณภาพของสื่อการเรียนรู้บอร์ดเกมสังคมศึกษาอยู่ในระดับมากที่สุด และมีประสิทธิภาพ ($E1/E2$) เท่ากับ $81.11/83.44$ ซึ่งเป็นไปตามเกณฑ์ $80/80$ 2. นักศึกษาครุสังคมศึกษาที่เรียนรู้โดยใช้สื่อการเรียนรู้บอร์ดเกมสังคมศึกษามีทักษะการคิดวิเคราะห์และความยึดมั่นผูกพันในการเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05

คำสำคัญ: สื่อการเรียนรู้บอร์ดเกม; สังคมศึกษา; ทักษะการคิดวิเคราะห์; ความยึดมั่นผูกพันในการเรียน

Introduction

The current global society is the era of the knowledge-based economy. Humans live amidst a wealth of information and news. The National Education Plan 2017-2036 occurred during the country's reform and changing global situation. The economy and society should adjust to be ready to support Thailand 4.0, be able to adapt to support future development contexts, have analytical skills, and be immune to changes in a learning society where Thais can learn continuously throughout their lives (Office of the Education Council, 2017). Current

learning management emphasizes active learning, and educational trends emphasize developing learners' skills, especially analytical thinking skills. Analytical thinking skills are vital today and paramount to career success (Brandt & Lorié, 2024). According to the World Economic Forum (2023) employers rank analytical thinking as the most important skill for workers.

Most university pre-service teachers still have problems with analytical thinking. According to the research of Aksornkan (2019), students have personality traits and behaviors that show analytical thinking equal to 2.60, which is a low level. Therefore, when considering the results of the survey and the study of documents on analytical thinking problems, it was found that there were consistent results: learners had a relatively low level of analytical thinking skills. These are consistent with interviewing the Head of Social Studies Program at Phanakhon Rajabhat University, he said that when asking analytical thinking questions, pre-service social studies teachers could explain according to their ideas but lacked logical analysis and connections. They could not explain to connect principles and analyze complex components and relationships (Soomprasert, 2024).

Board games are an interesting media of learning media and innovation that can be applied to manage learning activities because board games are a medium with many types, they are games that use cards or pieces or chess pieces placed on the playing area, moving on the playing area, ranging from simple rules to games with complicated rules that require a plan or strategy to help achieve the purpose of playing. In playing board games, players have fun and are entertained, players also practice analytical thinking skills, planning, and decision-making (Buranasinvattanakul, 2019). From the research results of Kruedsanoi & Kaewpuang (2023), it was found that educational games can help develop learners' learning engagement. Learners have fun, are not bored with learning, participate in learning activities according to their roles, and are more attentive to learning.

From the background, importance, and problems mentioned above, the researcher has studied and developed an innovation to solve the problem, which is a social studies board game learning media. The objectives are to develop the social studies board game learning media to enhance analytical thinking skills and



learning engagement of pre-service social studies teachers and to evaluate the effectiveness of the social studies board game learning media to achieve the objectives.

Research Objectives

1. To develop board game learning media in social studies to enhance analytical thinking skills and learning engagement of pre-service social studies teachers.
2. To evaluate the effectiveness of board game learning media in social studies on analytical thinking skills and learning engagement of pre-service social studies teachers

Methodology

1. Research Design

This methodology research was designed with research and development design (R&D). There were four steps of research methods based on the research of Kruedsanoi & Kaewpuang (2023) as follow:

Step 1: Research (R1). This step involved studying fundamental data on the teaching profession and teaching social studies courses, studying concepts and theories that related research.

Step 2: Development (D1). This step involved creating board game learning media in social studies, critiquing, and checking the quality of the board game learning media in social studies from the experts.

Step 3: Research (R2). This step involved preparing the experiment board game learning media in social studies, creating data collecting instruments, implementing the board game learning media in social studies, data collection, and data analysis.

Step 4: Development (D2). This step involved the evaluation of the effectiveness of board game learning media in social studies quantitative and qualitative data, developing the board game from the evaluation results.

In terms of step 4, quasi-experimental research was used as research methodology for this study. The experimental design was a Single Group Pretest - Posttest design.

Table 1 Experimental Design

Group	Pretest	Treatment	Posttest
E	T1, T2	X	T1, T2

E = Experimental group

X = Using board game learning media in social studies

T1 = Testing analytical thinking skills

T2 = Evaluating learning engagement

2. Populations and Samples

The population used in this research was pre-service social studies teachers who studied in social studies program, Bachelor of Education, Rajabhat University in Bangkok, Thailand. The samples used in this research were 30 pre-service social studies teachers who studied in social studies program, bachelor's degree in education, Phranakhon Rajabhat University, Thailand. The samples were obtained by cluster sampling, with a randomized unit as a classroom.

3. Research Instruments

There were two types of research instruments;

3.1 Data collecting instrument

3.1.1 Analytical Thinking Skills Test The researchers created and developed an analytical thinking skills test as the following steps:

3.1.1.1 Studied the course description and objectives of the course used as the content of the experiment.

3.1.1.2 Analyzed the theory and principles of creating an analytical thinking skills test using multiple-choice tests (4 choices). Researchers defined the content and objectives for creating an analytical thinking skills test.

3.1.1.3 Created an analytical thinking skills test. The test structure followed the cognitive domain of Bloom et al. (1985). It was a multiple-choice test consisting of 60 items. The scoring criterion was one point for a correct answer and zero points for an incorrect answer.

3.1.1.4 Asked the supervisor to check and give suggestions for improvement and sent an analytical thinking skills test to three experts to check the content validity by considering the Index of Item Objective Congruence (IOC), the results showed that the IOC was 1.00 for all items.



3.1.1.5 Tried out an analytical thinking skills test with 30 pre-service social studies teachers at Bansomdejchaopraya Rajabhat University, which is not a sample of the research.

3.1.1.6 Calculated the scores from the try-out of the analytical thinking skills test to analyze the difficulty (p) and discrimination (r). Then choose the exam with only 30 items to create an analytical thinking skills test. The result was that the difficulty (p) was 0.20-0.8, the discrimination (r) was 0.20-0.67, and reliability using Kuder Richardson's formula KR-20 was 0.92.

3.1.1.7 Used an analytical thinking skills test as a research instrument for collecting data with samples.

3.1.2 Learning Engagement Evaluation Form The researcher created and developed a learning engagement evaluation form as the following steps:

3.1.2.1 Study of books and research related to create the learning engagement evaluation form, especially definition, component, and guideline for writing evaluation form (rating scale).

3.1.2.2 Determine the purpose of the measurement; the purpose is to measure the learning engagement of pre-service social studies teachers. There were three aspects: cognitive, emotional, and behavioral.

3.1.2.3 Create a learning engagement evaluation form, a rating scale of five levels, and set criteria for interpretation as the Table 2

Table 2 Criteria for Interpretation of Learning Engagement

Rating levels	Criteria for interpretation
5 = Highest	4.51 – 5.00 = Highest
4 = High	3.51 - 4.50 = High
3 = Neutral	2.51 – 3.50 = Neutral
2 = Low	1.51 - 2.50 = Low
1 = Lowest	1.00 - 1.50 = Lowest

Source: Srisa-ard (2017).

3.1.2.4 Asked the supervisor to check and give suggestions for improvement and sent a learning engagement evaluation to three experts to check the content validity by considering the Index of Item Objective Congruence (IOC), the results showed that the IOC was 1.00 for all items.

3.1.2.5 Tried out a learning engagement evaluation form with 30 pre-service social studies teachers at Bansomdejchaopraya Rajabhat University, which is not a sample of the research.

3.1.2.6 Improved the items to be clear and suitable for use with samples and used a learning engagement evaluation form as a research instrument for collecting data with samples.

3.2 Experimental instrument The experimental instrument is Daily Lesson Plans Using Board Game Learning Media in Social Studies. The researchers created and developed daily lesson plans using board game learning media in social studies as the following steps:

3.2.1 Studied the course description and learning objectives of the Media, Innovation, and Technology in Social Studies course for designing the learning unit including studied creating daily lesson plans using board game learning media in social studies.

3.2.2 Created the daily lesson plans using board game learning media in social studies, 8 lesson plans (8 periods) for 2 months.

3.2.3 Asked the supervisor to check and give suggestions for improvement and sent the daily lesson plans using board game learning media in social studies to three experts to check the content validity according to the objectives, activity, media, and learning resources, including measurement and evaluation. Then analyze the Index of Item Objective Congruence (IOC), the results showed that the IOC was 1.00 for all items.

3.2.4 Improved the daily lesson plans using board game learning media in social studies according to the three experts' suggestions.

3.2.5 Tried out the daily lesson plans using board game learning media in social studies with 30 pre-service social studies teachers at Bansomdejchaopraya Rajabhat University, which is not a sample of the research.

3.2.6 Used the daily lesson plans using board game learning media in social studies for experiment with samples.

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4. Data Collection

4.1 Quantitative Data Collection: The researchers collected the scores of analytical thinking skills from analytical thinking skills test and scores of learning engagement from learning engagement evaluation form.

4.2 Qualitative Data Collection: The researchers interviewed pre-service social studies teachers about effectiveness of board game learning media in social studies.

5. Data analysis Statistics used to analyzed the data

The researchers analyzed the data from implementing research instruments both the analytical thinking skills test and the learning engagement evaluation form

5.1 Quantitative data analysis: The researchers compared the analytical thinking skills and the learning engagement of pre-service social studies

teachers in the experimental group between the pretest and posttest with the t-test statistic at the significance level of .05 (Dependent t-test).

5.2 Qualitative data analysis: The researchers analyzed effectiveness of board game learning media in social studies by interviewing pre-service social studies teachers. Statistics used in research: The data was analyzed using descriptive statistics; arithmetic mean, standard deviation, and t-test.

5.3 Statistics used in research: The data was analyzed using descriptive statistics; arithmetic mean, standard deviation, and t-test.

Results

1. Results of Developing Board Game Learning Media in Social Studies

1.1 Components of Board Game Learning Media in Social Studies, board game learning media in social studies to enhance analytical thinking skill and learning engagement of pre-service social studies teachers consisted of six key components: 1. board game title 2. objectives, 3. materials and objects, 4. rule of playing game, 5. players and 6. Stories. In this research, the researchers developed 6 board games as follows; 1. Tweet! Peep! Whoosh! Traffic Rules Board Game 2. Thai Culture Leads to Wealth Board Game 3. Power of Sufficiency Community Board Game 4. Adventures in the Asian Islands Board Game 5. Little Explorer of Bangkok Board Game 6. Treasure of Wisdom in Nakhon Nayok Board Game

1.2 Quality of Board Game Learning Media in Social Studies, the researchers developed seven board games using the ADDIE model. After that, the three experts evaluated the quality of board game learning media in social studies at a highest level ($\bar{X}=4.73$; $S.D.=0.16$) and had an efficiency ($E1/E2$) of 81.11/83.44, which followed criteria 80/80.

2. Results of Evaluating Board Game Learning Media in Social Studies

2.1 Analytical Thinking Skills

Table 3 Results of comparing the analytical thinking skills of the experimental group before and after Using Board Game Learning Media in Social Studies

Experimental Group	\bar{X}	S.D.	t-test	p-value
Pretest	13.37	1.43	26.817	0.000
Posttest	25.03	2.04		

* $p < 0.05$



From Table 2, the mean of pre services social studies teachers' analytical thinking skills before the experiment was 13.37 (S.D.=1.43) and after the experiment was 25.03 (S.D.=2.04). It was found that pre-service social studies teachers who learned board game learning media in social studies had higher analytical thinking skills than pre-experiment at a statistically significant level of 0.05.

2.2 Learning Engagement

Table 4 Results of comparing the Learning Engagement of the experimental group before and after Using Board Game Learning Media in Social Studies

Learning Engagement	Pretest			Posttest		
	\bar{X}	S.D.	interpretation	\bar{X}	S.D.	interpretation
Cognitive	2.90	0.63	Neutral	4.46	0.33	High
Emotional	3.07	0.68	Neutral	4.61	0.34	Highest
Behavioral	3.09	0.63	Neutral	4.45	0.39	High
Total	3.02	0.58	Neutral	4.51	0.25	Highest

From Table 3, the mean of pre-services social studies teachers' learning engagement before the experiment was 3.02 (S.D.=0.58), and after the experiment was 4.51 (S.D.=0.25). It was found that pre-service social studies teachers who learned board game learning media in social studies had higher learning engagement than pre-experiment. The overall level after the experiment was highest, with emotional engagement having the highest, followed by cognitive engagement and behavioral engagement having the high, respectively.

Discussion

1. Developing Board Game Learning Media in Social Studies The research results revealed that board game learning media in social studies consisted of six key components: 1. game title, 2. objectives, 3. materials and objects, 4. rules of playing the game, 5. players, and 6. Stories. The quality of board game learning media in social studies was at a high level. The researchers found that the finding was consistent with the research results of Chunthed (2019) who studied designing a board game to promote English vocabulary learning, by determining the important components of a board game, including players, objectives, rules or steps of playing, materials, and the outcome of the game.

2. Effectiveness of Board Game Learning Media in Social Studies on Analytical Thinking Skills and Learning Engagement The research results revealed

that pre-service social studies teachers who learned board game learning media in social studies had higher analytical thinking skills and learning engagement than pre-experiment at a statistically significant level of 0.05, which was consistent with research by Soybilge (2014) was found that the effects of mind improving board games on analytical thinking were proven. Board games have been designed according to age and education level to improve analytical thinking skills enjoyably. As mentioned, to be consistent with the research of Krueadsanoi & Kaewpuang (2023), it was found that the learners who learned using educational game activities packages in social studies (economics) had higher learning engagement than pre-experiment at a statistically significant level of 0.05.

Body of knowledge

The body of knowledge from this research is shown in Figure 1.

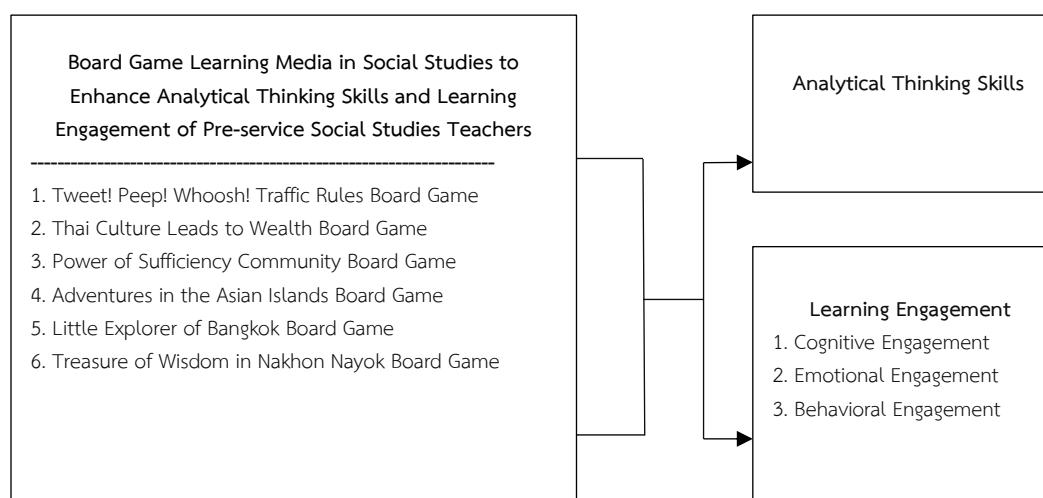


Figure 1 Relationship between Board Game Learning Media in Social Studies on Analytical Thinking Skills and Learning Engagement

From Figure 1, it can be seen that the board game researchers have developed consistent with the content of social studies according to the Thai basic education core curriculum, which included analytical thinking questions in the board game. Each game has a different way of playing and interesting points,



resulting in pre-service social studies teachers having analytical thinking skills and higher learning engagement in cognitive, emotional, and behavioral engagement. The development of board game learning media in social studies to enhance analytical thinking skills and learning engagement consists of 6 games covering 5 stands in social studies: 1. Religion, Morality, Ethics 2. Civics, Culture and Living in Society 3. Economics 4. History 5. Geography. Each game is used as a social studies learning media combined with Game-Based Learning (GBL) to help stimulate learners to be interested in learning social studies, which is difficult content, resulting in higher learning engagement, especially the emotional engagement, which is the highest compared to before learning, followed by cognitive engagement and behavioral engagement, respectively. The researchers integrated analytical thinking questions into all board games to develop social studies teachers' analytical thinking skills and enhance their skills. The learners participated in learning activities according to their roles and were more determined to learn social studies, resulting in pre-service social studies teachers had analytical thinking skills and learning engagement higher than before the experiment.

Recommendations

Policy Recommendations

University administrators should promote pre-service social studies teachers' learning inside and outside of class by arranging a learning space. They can learn using social studies board game learning media outside of class time.

Operational Recommendations

Instructors should study the guidelines for using board games learning media and lesson to develop the highest efficiency. Instructors should consider the consistency between the learning content and the duration of the learning activities using social studies board game learning media. Instructors must manage and allocate time appropriately for each learning activity.

Recommendations for Next Research

Researchers should study on the package of social studies board game learning media and create social studies board game learning media to develop higher-level thinking skills, such as decision-making, critical thinking, and creativity.

In summary, the quality of board game learning media in social studies was at the highest level. Pre-service social studies teachers had higher analytical thinking skills and learning engagement than pre-experiment. Therefore, administrators should support the board game learning media in terms of policy and practices. Instructors should study the guidelines for using board games learning media before using each game.

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