



## The Development of Basketball Learning Activities and Basketball Abilities Using Gamification Teaching Model for Advanced Vocational Student

Qian Song <sup>1</sup> and Thanyaluck Khechornphak <sup>2</sup>

<sup>1</sup> Master of Education (Program Curriculum and Instruction), Rajabhat Maha Sarakham University, Thailand

<sup>2</sup> Faculty of Education (Program Curriculum and Instruction), Rajabhat Maha Sarakham University, Thailand

E-mail: QianSong2567@gmail.com, ORCID ID: <https://orcid.org/0009-0006-7263-0441>

Corresponding E-mail: p.pbk13@gmail.com, ORCID ID: <https://orcid.org/0000-0003-0562-5002>

Received 20/05/2024

Revised 10/06/2024

Accepted 13/07/2024

### Abstract

**Background and Aims** The gamification teaching mode is a teaching method that integrates game elements into the teaching process. It stimulates students' enthusiasm and initiative and improves learning by creating a challenging and interesting play environment.

In physical education teaching, the gamification teaching mode has been widely used, especially in improving students' basketball dribbling ability.

Vocational students refer to those students who receive vocational education, and their learning goals pay more attention to the cultivation of practical skills and the improvement of application ability. As a common sport, basketball has important practical significance for higher vocational students. However, traditional basketball dribbling teaching is often based on technical training, which lacks enough interest and motivation, which can easily lead to the decline of students' learning interest and learning effect. Thus, the purposes of this study were 1) To develop learning activities for the gamification teaching model for the basketball course. 2) To compare basketball abilities using the gamification teaching model between the test and the post-test. And 3) To study student satisfaction with the gamification teaching model of the basketball course.

**Materials and Methods:** The sample included 50 first-year students from Luzhou Medical Device Vocational College. In the first semester of 2023. Obtained by cluster random sampling technique. Research tools are used in lesson plans, basketball ability tests, and satisfaction questionnaires. In data analysis including percentages, means, standard deviations, and paired t-tests.

**Results:** The results of the study were as follows; 1) The development of a gamification teaching model for the basketball course has an average suitability value for all plans equal to 4.38, which is at a high level. 2) Students who studied using gamification teaching model learning activities had higher abilities of basketball post-test than pre-test at a statistical significance of .05 and 3) Students who learned using the gamification teaching model had overall satisfaction at a very high level.

**Conclusion:** The basketball course's gamification teaching approach proved to be a highly appropriate and successful one, greatly enhancing students' post-test performance and generating exceptionally high levels of student satisfaction. According to the study, gamification can improve learning outcomes and increase student engagement in the classroom.

**Keywords:** Gamification Teaching; Basketball Abilities; Satisfaction

### Introduction

The gamification teaching mode is a teaching method that integrates game elements into the teaching process. It stimulates students' enthusiasm and initiative and improves learning by creating a challenging and interesting play environment.

In physical education teaching, the gamification teaching mode has been widely used, especially in improving students' basketball dribbling ability.

Vocational students refer to those students who receive vocational education, and their learning goals pay more attention to the cultivation of practical skills and the improvement of application ability. As a common sport, basketball has important practical significance for higher vocational students. However, traditional basketball dribbling teaching is often based on technical training, which lacks enough interest and motivation, which can easily lead to the decline of students' learning interest and learning effect.

Therefore, it is of great practical significance to study how to improve the basketball dribbling ability of higher vocational students through the gamification teaching mode. Creating a challenging and interesting game environment to stimulate students' interest and motivation in learning, can better promote the improvement of students' skills and ability development. Also cultivate students' sense of teamwork, competition, and self-learning ability, which are the professional qualities that higher vocational students need to possess.

Past studies have shown that the gamification teaching model has significant advantages in improving students' learning interest and learning effect.



For example, some studies have found that by transforming basketball dribbling skills training into interesting game tasks, students' enthusiasm and initiative can be stimulated, and their learning motivation and learning effectiveness can be improved. In addition, the gamification teaching mode can also gradually improve students' basketball dribbling skills and cultivate their concentration and reaction ability by setting different game levels and challenges.

However, there are relatively few studies on the influence of gamification teaching mode on the basketball dribbling ability of higher vocational students. Therefore, it is necessary to carry out relevant research to explore how the gamification teaching mode affects the basketball dribbling ability of higher vocational students.

This will help to provide more effective basketball dribbling teaching methods for higher vocational students, improve their skill level and competitive ability, and lay a solid foundation for their future career development.

**Significance:** Research significance is an explanation and explanation of the importance and value of the research to show why the research needs to be carried out. The research on the influence of gamification teaching mode on the basketball dribbling ability of higher vocational students has the following significance: Enrich the teaching methods of physical education: Traditional basketball dribbling teaching often focuses on technical training, which lacks motivation.

Studying the influence of gamification teaching mode on the basketball dribbling ability of higher vocational students, can provide new teaching ideas and methods for physical education and enrich the teaching methods of physical education.

**Improve students' learning interest and motivation:** The gamification teaching mode can create a challenging and interesting game environment to stimulate students' learning interest and motivation. Studies have shown that learners are more likely to engage in learning and improve learning effectiveness in a gamified environment. Therefore, studying the influence of gamification teaching mode on the basketball dribbling ability of higher vocational students can improve students' learning interest and motivation, and promote their skill improvement and ability development.

**Cultivating a sense of teamwork and competition among students** which playing basketball is a team sport Teamwork and competition are crucial to improving basketball dribbling ability. Through gamification teaching mode We can set up multiplayer game missions to instill a sense of teamwork and competition among students. For vocational students, this can not only improve students' basketball abilities. But also cultivates professionalism, unity, leadership, and the ability to work as a team. Promoting the development of higher vocational education Higher vocational students are students who receive vocational education. And their learning goals place more emphasis on developing practical skills and improving application abilities.

From the above-mentioned, the researcher, therefore, developed the development of basketball learning activities and basketball abilities using the gamification teaching model for advanced vocational students to study the influence of the gamification teaching model on the basketball abilities of students at the advanced vocational level. High To develop self-learning activities emphasizing appropriate practice and new teaching methods to learners. Promote analytical thinking Planning to solve problems and solving immediate problems in working as a team to achieve goals It promotes motivation for students to be enthusiastic about learning and determined in what they do. It also develops your skill level and competitiveness and lays a solid foundation for your future career development. At the same time, it can also strengthen the teaching methods of physical education and promote the development of advanced vocational education.

## Research Objectives

- 1) To develop learning activities for the gamification teaching model for the basketball course.
- 2) To compare basketball abilities using the gamification teaching model between the pre-test and the post-test.
- 3) To study student satisfaction with the gamification teaching model of the basketball course.

## Research Hypothesis

The students who learned using the gamification teaching model had higher basketball abilities post-test than pre-test.



## Literature Review

Shang and Pei (2015) discussed the theory of "Learning by Gamification" and pointed out that the main educational value of "games" is expressed from the surface to the deep: game motivation, game thinking, and game spirit.

Li (2016) mentioned that game motivation means using games to learn. Game thinking means turning learning into a game. And the spirit of the game means turning the entire learning process and even the whole life into a "game" when the brain feels a special reward. Dopamine neurons in the midbrain are stimulated and release dopamine. This has a major impact on the functioning of neurons in the prefrontal cortex and other brain regions. Of the whole brain

This study mainly discusses the educationalization of games. If a game exerts a directional, purposeful, and planned influence on players, it embodies the educational nature of the game, that is, the educationalization of games. Games and education can be integrated and developed synergistically. Evolution.

Gamification teaching is an effective teaching strategy that combines teaching with fun (Chen, 2018). Gamification teaching is to integrate games into the traditional teaching mode to make up for the shortcomings of traditional teaching, stimulate students' interest in learning, and improve the classroom Teaching environment, to better complete teaching tasks (Liu, 2018).

Domestic scholar Gu Mingyuan pointed out in the "Dictionary of Education" that teaching games are a teaching method that integrates teaching knowledge points and interesting games based on teaching objectives (Gu, 1990); Shang Junjie believes that gamification learning in a narrow sense is a Refers to the application of games, especially electronic games, to the learning process.

In a broad sense, gamification learning refers to the application of games or game elements, concepts, or designs to learning (Shang and Qu, 2019) divides gamification teaching into two aspects: one is to integrate games or game-related elements into teaching and apply them to the entire teaching activity; another kind of gamification design of teaching activities based on the concept of games is to apply teaching activities in the form of game activities (Hu, 2021).

To sum up, combined with previous research results, this paper defines gamification teaching as gamification teaching refers to the application of game elements and mechanisms in the teaching process, combining teaching materials and teaching objectives to carry out teaching activities to improve learning. Engagement and motivation of learners, and facilitate the acquisition of knowledge and skills.

(Mihaly, 1990) discussed flow theory. Which was first proposed as heart flow It refers to a state of mind that is characterized by focusing attention on a certain activity and reaching an extremely pleasurable state of mind. When you're enthusiastic You will focus your attention on it and filter out all the extraneous perceptions in the surrounding environment. The performance of the activity will be improved and you will fully enjoy the pleasurable experience of the activity. This state of mind is called the flow state. Later, (Wang and Wei, 2014) combined flow theory to design an educational game for special children's language learning. And found that such games help children They can improve their grades and learning efficiency.

Some scholars have also shown that if learners feel a fluid experience in educational games, such games will have a positive impact on the students. This provides teachers with knowledge of the gamification teaching process and the need to design gamification teaching elements reasonably. To motivate students Immerse yourself in the classroom atmosphere and have a smooth experience.

## Scope of Study

### 1) Population and Sample

1.1) The population included 6 rooms. There are about 300 students enrolled. There are first-year students from Luzhou Luzhou Medical Device Vocational College in Luzhou City, Sichuan Province. In the first semester of 2023

1.2) The sample includes 50 first-year students from Luzhou Medical Device Vocational College. In the first semester of 2023. Obtained by cluster random sampling technique. (Worakham. 2021)

### 2) The variables studied in the research

2.1) Independent Variable: Learning activities using the Gamified teaching model

2.2) Dependent Variables: (1) Basketball abilities and (2) Students' satisfaction

### 3) Content

The content in the basketball course used to teach students Using gamification teaching has 5 lesson plans. Each plan takes 135 minutes. (Excluding pre-test and post-tests)

Step 1 Basic study of basketball theory





- Step 2 Basketball Each basic movement learning
- Step 3 Basketball special basic physical practice
- Step 4 Basketball shooting project practice
- Step 5 Basketball actual combat ability learning

#### 4) Research Period

In the second semester of 2023, and 5 weeks of research time

#### Research model

This research used an experimental design in the form of experimental research (Experimental Research) One Group Pretest-Posttest Design and One Group Posttest Only Design (Worakham,2021)

**Table 1** Research plan: One Group Pretest-Posttest Design

random	group	Test first	Experimental thing	Test after
-	E	O	X	O2

When E means Experimental group  
O<sub>1</sub> means Measuring variables before experimenting  
X means Giving an experiment  
O<sub>2</sub> means Measuring variables after the experiment

#### Research tools

This research the researcher designed and built a research tool to collect data. Consists of 3 important research tools as follows:

##### 1) Lesson plans

To effectively improve the students' basketball performance. And to further deepen the students' understanding of basketball. College student basketball course, in the form of gamification mode. Organize 3 learning activities every week, each teaching time is 45 minutes, a total of 5 weeks, and the total teaching time is 675 minutes. There are 5 course plans, and the steps to create the course plan are as follows.

- 1.1) Study courses in educational institutions, and study curriculum descriptions in basketball.
- 1.2) Analyze the relationship between the content and the learning objectives. Consistent with the gamification teaching model learning activities
- 1.3) Study the concepts, principles, theories, and steps of writing learning lesson plans using gamification teaching model
- 1.4) Prepare the study management plan to align with the created, with 5 plans and 135 minutes each. (Excluding pre-test and post-test)
- 1.5) Use the learning plan created by the researcher. Present to the thesis advisor. To check and consider the appropriateness of the lesson plan.
- 1.6) Take the learning management plan and revise it. Then present it to experts to assess the suitability of the learning management plan. List of experts, 3 people.
- 1.7) Use the evaluation results from experts. The average value was analyzed. To compare with the evaluation criteria of the rating scale (Rating Scale) according to the Likert method, 5-level option type, with the evaluation criteria as follows (Srisa-ad. 2010) The evaluation criteria must have an average score from 3.51 - 5.00, considering the level of quality, suitability, and most suitability. Therefore, it is considered that the learning management plan can be used in research. The lesson plan has an appropriate value equal to 4.38. There is a high level of appropriateness in every plan.
- 1.8) Take the revised lesson plan according to expert recommendations and print it as a complete version for implementation with the sample.

##### 2) Basketball abilities test

The researcher created a measure of students' basketball abilities. The important steps are as follows.

- 2.1) Study principles, concepts, and theories related to ability measures. And how to create a tool to measure basketball ability
- 2.2) Create a basketball ability test and design the structure of the ability test according to the items to be measured.







2.3) Prepare a list of ability measures with five levels of rating scales, with scoring criteria and criteria for evaluating basketball ability levels as follows: (Sisaard,2010)

2.4) The basketball ability test has been presented to the thesis advisor and revised according to suggestions.

2.5) Present the basketball ability test to the original experts. To examine the consistency between term definitions and basketball ability assessment items.

**Table 2** The table lists the main and minor items in measuring and evaluating basketball ability.

Main Item	Sub Item
1. shoot at the basket (20%)	One-minute fixed shot
	One minute shot shot
	A 2-point shot
	The 3-point line shot
2. Basic technique (20%)	dribble
	Touch high
	Lay up the shot
	pass
3. Physical fitness (20%)	One-minute push-ups
	one-minute sit-up
	Running at 400 meters
	long jump
4. Combat capability (20%)	Style of competition
	sense of tactics
	Technology use
	team spirit
5. Theoretical knowledge (20%)	The origin of basketball
	Tactical knowledge
	Technical theory
	physical fitness training

#### Criteria for measuring basketball ability

Excellent (76-100 points)	Correct action, coordination, coherence, and effectiveness; The application of technology is reasonable and the application effect is good; The tactical cooperation consciousness is strong, and the actual combat effect is good.
Good (51-75 points)	Correct movement, and coordination; The application of technology is more reasonable and the application effect is better. The tactical cooperation consciousness is strong, the actual combat effect is better.
Medium (26-50 points)	Movements are correct and coordinated; The application of technology is reasonable and the application effect is general. The tactical cooperation consciousness is general, the effect is general.
Difference (0-25 points)	Incorrect and uncoordinated movements; Unreasonable technical action and poor application effect; The tactical cooperation consciousness is poor and the effect is poor.

2.6) Analyze the IC (Index of Item Congruence) value of every evaluation item. Considering the consistency criteria that can be used from 0.50 and above, this questionnaire has an actual value of 1.00 for every question, and 20 practice questions selected (Worakham,2021)



2.7) Prepare a complete basketball ability test. To be used to collect data with samples.

### 3) Satisfaction Questionnaire

The researcher prepared a questionnaire on student satisfaction with the use of gamification teaching-learning activities with the following steps.

3.1) Study principles, concepts, and theories related to satisfaction. And methods for creating a tool to collect data on student satisfaction with the use of gamification teaching-learning activities using a questionnaire.

3.2) Create a satisfaction questionnaire and design the questionnaire structure according to the type of questionnaire.

3.3) Prepare a list of questionnaires and create a satisfaction questionnaire by the definition of specific terms. The score level (Rating Scale) is determined using the 5-level Likert method, which has scoring criteria and criteria for interpreting satisfaction results as follows (Srisaard. 2010)

3.4) The questionnaire has been prepared. Presented to the same set of experts. To consider and evaluate the consistency (Index of Item Congruence: IC) between the definitions of terms and the question list.

3.5) Analyze the consistency value (IC) of every question item of the created questionnaire. Considering the criteria that can be used from 0.50 and above, this questionnaire has an actual consistency value of 1.00 for every question item. And all 13 items can be used (Worakham, 2021)

3.6) Prepare a complete satisfaction questionnaire. For use in collecting data with sample

#### Data collection

1) Before teaching the students in the gamified way, through 20 questions, each question worth 5 points, a total of 100 points, give the students' results before using the gamified teaching.

2) This study lasted for five plans with the following steps:

In this study, 50 students started the test without teaching and passed 20 questions, 5 points each, a total of 100 points, giving student performance before using gamified teaching.

3) After 135 minutes, a total of 450 minutes, the students were tested for basketball ability, and the test results were recorded and saved for data analysis.

4) The accuracy of the questionnaire was checked by asking students to complete a questionnaire about their satisfaction with their learning activities, 1 copy. The data is then recorded and stored for data analysis.

#### Data analysis

The researcher takes the data obtained from collecting all the data to analyze the research data in quantitative and qualitative research according to the research objectives. The details are as follows:

1) Analyze the quality of all lesson plans by finding the average suitability of the lesson plans by analyzing the mean and standard deviation.

2) Analyze data and compare student academic achievement. Between the average score before and the average score after school Using statistical hypothesis testing, t-test (depending on the sample) using Excel program.

3) Analyze data from the satisfaction test. To study the level of student satisfaction with the use of integrated activities. By taking the scores to find the mean, and standard deviation using the Excel program. And interpreting the data according to the following criteria: (Srisa-ad. 2010)

An average of 4.51 – 5.00 means that it is considered very high satisfaction.

An average of 3.51 – 4.50 means that they are highly satisfied.

An average of 2.41 – 3.50 means that there is medium satisfaction.

An average of 1.51 – 2.40 means that there is low satisfaction.

An average of 1.00 – 1.50 means that they are lowest satisfied.

#### Results

1) Results of developing learning activities for gamification teaching model for the basketball course.





In the development of a gamification teaching model for the basketball course, a total of 5 teaching plans were designed by studying the curriculum in educational institutions. And study the description of the course in basketball Analyze the relationship between content and learning objectives. Consistent with the learning activities of the gamification teaching model, the researcher has studied the concepts, principles, theories, and steps in writing lesson plans using the gamification teaching model, which uses learning activities of 135 minutes per plan. The lesson plan developed by the researcher has important elements: 1) learning objectives, 2) basketball teaching content, 3) learning activities using a gamification teaching model, and 4) measurement and evaluation. The teaching plan is then presented to the advisor to consider overall accuracy and to provide additional advice. After that, the lesson plans are presented to experts to evaluate the suitability of all lesson plans. Which are 3 experts with expertise in curriculum and teaching. Educational measurement and evaluation and statistics and research the evaluation criteria are compared with the evaluation criteria of the Rating Scale (Rating Scale) according to the Likert method, 5-level choice (Srisaard. 2010), and the lesson plan has an appropriate value of 4.38, which is appropriate in All plans are high level.

2) Comparative results of basketball ability using the gamification teaching model between the test and the post-test.

Comparative results of basketball ability using the gamification teaching model between the test and the post-test. The results of the data analysis appear in the following table.

**Table 3** Students' basketball ability scores, pre-test scores, and post-test scores

No.	Pre-test (100 Point)	Post-test (100 Point)	results
1	58	80	Excellent
2	66	90	Excellent
3	57	81	Excellent
4	52	74	Good
5	55	79	Excellent
6	61	81	Excellent
7	52	73	Good
8	53	77	Excellent
9	51	71	Good
10	64	88	Excellent
11	52	74	Good
12	57	79	Excellent
13	70	94	Excellent
14	51	71	Good
15	62	87	Excellent
16	52	74	Good
17	64	86	Excellent
18	70	91	Excellent
19	60	81	Excellent
20	69	92	Excellent
21	52	77	Excellent
22	58	82	Excellent
23	52	74	Good
24	53	78	Excellent
25	51	72	Good
26	54	77	Excellent
27	62	91	Excellent
28	52	73	Good
29	55	80	Excellent
30	62	83	Excellent



No.	Pre-test (100 Point)	Post-test (100 Point)	results
31	72	93	Excellent
32	51	72	Good
33	72	93	Excellent
34	63	88	Excellent
35	67	93	Excellent
36	56	81	Excellent
37	64	88	Excellent
38	57	82	Excellent
39	72	94	Excellent
40	52	75	Excellent
41	64	89	Excellent
42	70	92	Excellent
43	66	87	Excellent
44	55	79	Excellent
45	57	82	Excellent
46	61	86	Excellent
47	73	94	Excellent
48	64	84	Excellent
49	65	87	Excellent
50	61	83	Excellent
Sum	2989.00	4132.00	
Average	59.78	82.64	Excellent
S.D.	6.83	7.08	

**Table 4** Table showing basketball ability scores using the gamification teaching model between the test and the post-test.

Test	n	Full score	$\bar{X}$	S.D.	t-test
Pre-test	50	100	59.78	6.83	6.98
Post-test	50	100	82.64	7.08	

It was found that the development of students' knowledge and understanding was significantly different at the .05 level. Students tested according to integrated learning activities had knowledge. Understanding and being Able to score higher on exams than before Makes the study behavior of students according to the wishes and results the academic performance of students after teaching according to integrated learning activities is higher than before studying according to the standards of Development of academic achievement The development of with statistical significance at the .05 level.

3) Results of the study on student satisfaction with the gamification teaching model of the basketball course.

Results of the study of student satisfaction with the gamification teaching model of the basketball curriculum. The results of the data analysis appear in the following table.

**Table 5** Mean ( $\bar{X}$ ) Standard deviation (S.D.) questions on the Satisfaction of Students with the satisfaction gamification teaching model.





List of questions	$\bar{X}$	S.D.	Description
1. I like game-based teaching, which helps improve students' sports participation.	4.86	0.35	Very high
2. I like game-based teaching. Because it can increase interest in the physical education curriculum.	4.92	0.27	Very high
3. I like teaching sports in games. Because it helps develop more motor skills.	4.90	0.30	Very high
4. I like sports game activities that can increase cooperation and teamwork.	4.94	0.23	Very high
5. I like teaching how to play sports games that can improve self-confidence.	4.88	0.32	Very high
6. I like playing games in sports. Because it has a positive effect on physical and mental health.	4.88	0.32	Very high
7. I like sports games that can increase my understanding and knowledge of sports.	4.82	0.38	Very high
8. I can improve the participation and motivation of myself and my classmates.	4.92	0.27	Very high
9. I like and enjoy sports and gaming activities.	4.92	0.27	Very high
10. I can improve my sports abilities and rules.	4.90	0.30	Very high
11. I can improve my practicality and ability to coordinate with my peers.	4.88	0.32	Very high
12. I like sports games that can increase students' interest in sports games and more competition	4.86	0.35	Very high
13. I am happy to be involved in teaching sports games and can apply them in the future.	4.84	0.37	Very high

## Conclusion

1) The development of a gamification teaching model for the basketball course has an average suitability value for all plans equal to 4.38, which is at a high level.

2) Students who studied using gamification teaching model learning activities had higher abilities of basketball post-test than pre-test at a statistical significance of .05

3) Students who learned using the gamification teaching model had overall satisfaction at a high level ( $\bar{X} = 4.88$ , S.D. = 0.31)

## Discussion

1. Development of a gamification teaching model for the basketball court. The average suitability value of all plans is 4.38, which is at a high level. This is because the researcher designed the teaching plan by studying the curriculum in the educational institution. And study basketball course descriptions. Analyze the relationship between content and learning objectives. In line with the development of gamification learning activity plans, all lesson plans were then presented to experts to assess the appropriateness of all lesson plans. Who are experts in curriculum and teaching educational measurement and evaluation and statistics and research by comparing the evaluation criteria with the evaluation criteria Rating Scale (Rating Scale) according to the Likert method (Srisaard, 2010) and obtained the teaching plan with an average of the appropriateness of all plans equal to 4.38, which is consistent with the concept. Constructivism of Piaget de Vries, (Kohlberg, 1990) presented principles of learning management that 1) encourage students to do many different activities and 2) teachers are the center of friends giving advice. Encourage students to play and experiment using logic and sound. Then advise students again and 3) encourage most students to be able to learn and solve problems peacefully. This is consistent with (Li and Yang, 2016) idea that the motivation in games is using games to learn. Game thinking means turning learning into a game. And the spirit of the game means changing the entire learning process. And even the whole life is turned into a "game" when the brain feels a special reward. Neurons in the midbrain are





stimulated. This has a major impact on the active activity of neurons in the prefrontal cortex and other parts of the brain throughout the brain. This is in line with the (Karl,2019) idea that gamification is the use of game mechanics, aesthetics, and game thinking to engage others. Promote behavior Promote learning and problem solving This is in line with the research of (Khamkaew,2021) who studied the results of learning activity sets based on the concept of playing games. To develop students' creative problem-solving skills. It was found that the results of comparing creative problem-solving ability before and after using the activity set. Learn by playing game concepts. It was found that the value after use was significantly higher than before use at the 05 level.

2. Students who study using gamification-based learning activities Their abilities after the basketball exam were higher than before the exam. Statistically significant at.05. The success of the gamification learning activity regarding basketball dribbling ability Shows that students have developed knowledge Understand the lesson content and learning objectives better than before studying. This is because students receive systematic instruction according to the steps of the Gamification teaching method that the researcher applied from the concept of There are 4 steps: 1) Identify Learning Outcomes. 2) Choose a Big Idea 3) Design Learning Activities and Build Teams and 4) Apply Game Dynamics, allowing students to learn in an appropriate sequence. Have an understanding and be able to develop basketball abilities very well. Including having fun in learning through playing games and having fun. More fun in learning the students is enthusiastic. Understand the lesson and can be remembered because they practiced solving problems by themselves using games Consistent with the concept cited in the mentioned gamification. (also known as Gamify) involves integrating game mechanics into student learning. Using rewards to motivate players who achieve their goals Because when students have clear goals, they can plan and create motivation to complete their missions according to their goals. And (Yang,2012) said that gamification is based on game teaching theory. The health of students comes first as the main guiding ideology. According to the laws of human understanding of sports and the development of people's skills in certain sports. This is the part that can develop students' basketball abilities to a higher level. This is consistent with the research of (Khamkaew,2021). Study the results of learning activity sets based on the concept of gamification. To enhance students' creative problem-solving skills, it was found that the results of comparing the ability to think creatively in solving problems before and after using the learning activity set. Get to know the concept of gaming along with using games for education. It was found that after-use was higher than before-use without statistical significance at the.05 level and consistent with the study of (Wannakul,2021) studied the development of learning activity sets based on the concept of gamification to promote teamwork skills in the subject is research and knowledge creation. The research results found that the development of students' teamwork skills from using learning activity sets is based on the concept of gamification. It was found that students had teamwork skills in the earlier stages. Studying, during the study, and after the study were significantly different at the.05 level.

3. Students who learned using the gamification teaching model had overall satisfaction at a very high level ( $\bar{X} = 4.88$ , S.D. = 0.31). Arranged in order of the highest satisfaction as follows. Students like sports game activities that can increase cooperation and teamwork ( $\bar{X} = 4.94$ , S.D. = 0.23), followed by students who like teaching using games. Because it can increase interest in the physical education curriculum ( $\bar{X} = 4.92$ , S.D. = 0.27), students can improve their own and their classmates' participation and motivation ( $\bar{X} = 4.92$ , S.D. = 0.27), and students like and enjoy the activities. Playing sports games ( $\bar{X} = 4.92$ , S.D. = 0.27). This phenomenon is consistent with the idea of (Luo,2006) who believes that constructivism is about looking for individual understanding, meaning, and motivation between different subjects. It is believed that the human brain can think and act. With passion and enthusiasm Can actively create and change the reality of things in society. Teaching constructivist theory actively guides students in creating new ways of searching, thinking, and solving problems from the student's perspective in the teaching process. Allow students to express their feelings, explore, and find answers that they realize are truly right for them. Students therefore feel happy when learning fully on their own. It is consistent with the concept of (Maslow,1954) who explained the hierarchy of human needs at the third level, which is social needs. Love and commitment Both in the form of being a giver





of love and receiving love from various people. Ownership Requirement (Belongingness) wants to have good relationships with others and level 4 is the need for honor and reputation (Self-esteem Need) is a necessary emotion in which one is useful and valuable. It is related to the need for status (prestige) such as position, and reputation, the need for respect (recognition), and the need to view oneself as having value (Esteem), which is consistent with the research that studied the results of Use game activities on various systems in the human body to promote creativity and academic achievement of students by studying the analytical principles and content of activities to provide an appropriate framework for students. The content is arranged from easy to difficult. The results of the study found that Students who use science game activity kits will develop their creativity and perseverance in learning. Makes it fun, and interesting and promotes learning well

### Suggestions from research

#### 1. Teaching and learning suggestions

- 1) Development of gamification-based learning activities the results of developing academic achievement should be studied together with practical skills as well.
- 2) Motivation and positive reinforcement should be found to suit the subject and the age or interests of the learner. To create more motivation to play games
- 3) Students should record their opinions each week so that Know what students' opinions are on the use of each game in the learning activities based on the concept of gamification. To analyze and find qualitative data

#### 2. Suggestions for research

- 1) In the next research, results should compare theoretical learning and practical skills of students during teaching to develop academic achievement through
- 2) In the next research, it should be a textbook or a model for developing academic achievement in a layered manner for all subjects.
- 3) A learning management plan should be used to use with students at other schools to comparatively study the context that is different from this study, such as the number of students in the class.
- 4) Research should be done on teaching layered with other subjects or other grade levels to study the academic achievement and attitude toward learning of students

### Acknowledgment

This research was successful because it was received with great kindness and care from Asst.Prof.Dr. Thanyaluck Khechornphak, thesis advisor kindly provided advice. Assistance and supervision, as well as always providing support and encouragement in completing this thesis until it is completed successfully the researcher would like to thank all of the Thesis Defense Examination Committee very much for their useful suggestions that helped develop this research to perfection. The researcher is extremely grateful and would like to thank everyone very much for being here.

Thank you to all instructors and staff of the Master of Education Program in Curriculum and Instruction. Including all the expert teachers who kindly assisted. Promote and support researchers well and give encouragement to researchers continuously. The researcher would like to thank you very much.

Thank you to my family for teaching me. Give love, good wishes, care, attention and always be there for you. The value and benefits of this thesis, the researcher would like to give to the sacrifice of grace of all teachers who have contributed to the prosperity of education and helped the researcher to complete his studies.

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