



A Comparison TYCG Education: Advancing Creative Thinking for Youth Development

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Abstract

This research article was conducted with the objectives of 1) training children to think outside the box without being confined to conventional ideas and to develop cognitive flexibility 2) fostering children's habits of learning new things and encouraging self-improvement; and 3) enhancing communication skills and encouraging them to express their opinions more confidently. Data were analyzed using frequency and standard deviation.

The results revealed that 1) children were not confident in expressing their opinions within groups because they were afraid that their opinions might cause problems or that they might make mistakes 2) children preferred engaging in new activities rather than repeatedly doing the same activities for a long period of time; and 3) children enjoyed playing games. Although the activities involved learning, presenting them in the form of games could motivate and attract children's interest more effectively than conventional teaching methods.

From the survey results, the percentage analysis of the post-board game evaluation in educational institutions indicated that the sample group expressed opinions at high to highest levels in all aspects. Players were able to think of solutions and generate new ideas from the materials provided, as well as creatively apply objects to solve problems. In addition, players understood the situations and tasks assigned to them and were able to adjust their ways of thinking when facing limitations. They were also able to appropriately explain their ideas and reasons for selecting solutions. Furthermore, they demonstrated the ability to listen to and

respect the opinions of others. Participants reported enjoyment and satisfaction with the board game and expressed a desire to play the game again in the future. These findings reflect that the board game can effectively promote creative thinking, problem-solving, communication, and collaboration skills.

Keywords: Tycg education, card game, creativity, out-of-the-box thinking, application of knowledge

Introduction

In the present era, where the world is driven by innovation and technology, traditional education that emphasizes "memorization" in order to obtain only one correct answer is no longer sufficient to prepare young people for the future. This system often restricts ways of thinking, hinders imagination, and causes children to lack confidence in trying new things or dealing with mistakes.

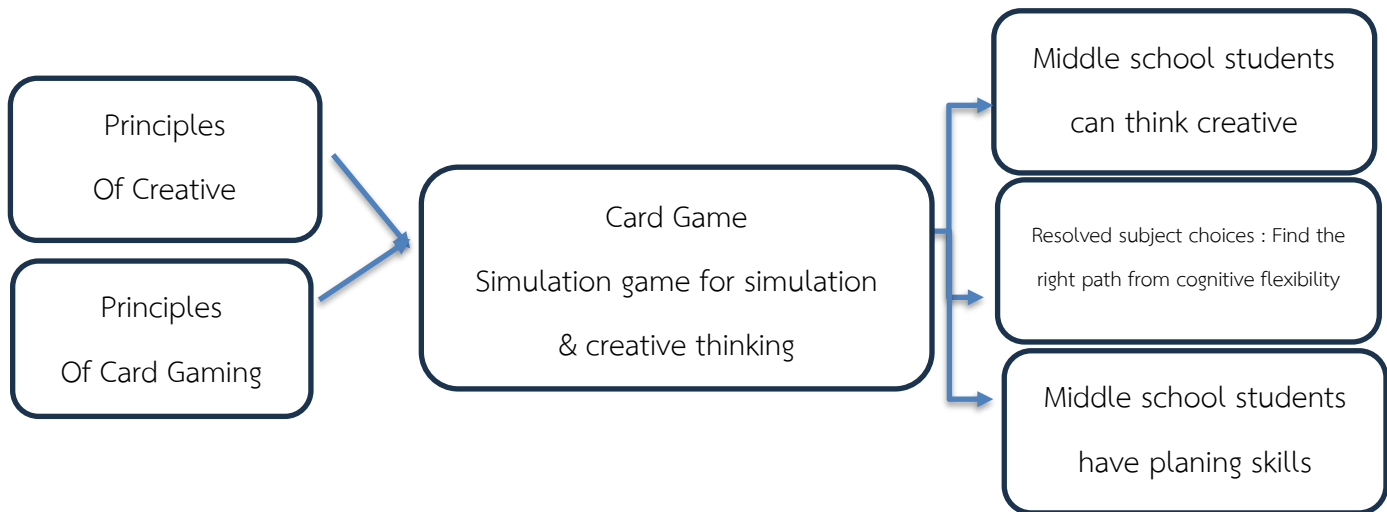
Considering adolescents aged 13–15 years (lower secondary education level), this period is regarded as a critical stage characterized by rapid cognitive and identity development. Without proper support for thinking skills, children may grow up lacking complex problem-solving skills and cognitive flexibility, which are among the most important future skills according to the rankings of the World Economic Forum.

Therefore, this study aims to encourage children to think outside the box without being limited to conventional ideas and to develop cognitive flexibility. It also aims to cultivate habits of learning new things and encourage self-improvement, as well as to enhance communication skills and increase confidence in expressing their own opinions. Data were analyzed using frequency and standard deviation.

Objectives

1. To study and apply the creative thinking process as a foundational pillar for systemic learning.
2. To develop out-of-the-box thinking and cognitive flexibility among students aged 13–15, preparing them to effectively navigate complex situations.
3. To design a tangible and practical framework for creative thinking for students aged 13–15, aligned with international standards.

Conceptual Framework



Research Methodology

This study was conducted according to the following procedures:

1. Research Procedure

Information on creativity was collected, and a game related to creativity was designed and planned.

2. Research Sample

1) Students from Triam Udom Suksa Pattanakarn Ratchada School and students in the NBI YES Program.

3. Research Instruments and Instrument Quality

1) Research Instruments

1.1) Post-board game evaluation form.

1.2) Analysis results from the sample group.

Research Findings

The analysis results from the sample group are presented in three parts. Part 1 presents the analysis of the literature review table on theories of creativity development. Part 2 presents the analysis of the literature review table on creative thinking. Part 3 presents the percentage analysis table of the post-game evaluation results in educational institutions. From conducting game-

playing activities with students and evaluating them after playing in educational institutions, the details are presented as follows.

Part 1: Analysis Results of the Literature Review Table on Theories of Creativity Development

1. Analysis Results of the Literature Review Table on Theories of Creativity Development

1) Simulation scenarios 2) Self-directed learning through hands-on practice 3) Limited resources with measurable outcomes 4) Construction of new knowledge through play 5) Imagination development to break conventional ways of thinking 6) Reduction of the fear of making mistakes 7) Out-of-the-box thinking 8) Cognitive flexibility 9) Systematic logical thinking The details are presented in Table 1.

Table 1

Literature Review Table on Theories of Creativity Development

Project	Naphatsorn Meemongkol. (2020). Chulalongkorn University. Development of a Board Game to Promote Creative Problem-Solving Thinking.	Visith Jitsawang. (2021). Thammasat University. Learning Through Games for Reflection and Inner Transformation.	Rakphon Thanaphum. (2022). Srinakharinwirot University. Effects of Using a Board Game with Resource Management Mechanics on Critical Thinking.	Surasak Kao-ian. (2019). Kasetsart University. Development of Game-Based Learning Activity Packages to Develop Divergent Thinking.	Piyachat Jittham et al. (2022). Mahidol University. Board Game Design to Promote Systems Thinking and Innovation Skills.	Pongpipat Saithong. (2021). King Mongkut's University of Technology Thonburi (KMUTT). Development of an Experiential Learning Model to Promote Innovation Creation Ability.	Jeera Prapa Akkarabovorn. (2022). Silpakorn University. Card Game Design to Promote Imaginative Thinking for Design Students.	Tharak Saraphan. (2020). Burapha University. Effects of Using Board Games on Reducing Fear of Failure and Increasing Achievement Motivation.	Chaiporn Phanich Ruttivong. (2023). Rangsit University. Gamification Process for Developing Out-of-the-Box Thinking Skills.	Pichitphon Pinmanee. (2021). Naresuan University. Development of a Board Game to Promote Flexibility.	Frequency
Simulation Scenario	✓										1
Self-Learning Through Hands-On Practice		✓									1
Limited Resources			✓								1
Measurable Outcomes				✓							1
Constructing New Knowledge Through Play					✓						1
Creating Imagination to Break Traditional Ways of Thinking						✓					1
Reducing Fear of Failure							✓				1
Out-of-the-Box Thinking									✓		1
Cognitive Flexibility						✓					1

The results of the literature review analysis on theories of creativity development revealed that simulation, self-directed learning through hands-on practice, limited resources, measurable assessment, constructing new knowledge through play, using imagination to

break away from conventional thinking, reducing fear of making mistakes, thinking outside the box, cognitive flexibility, and systematic logical thinking all had the same frequency (f = 2)

Part 2: Analysis Results of the Literature Review Table on Creative Thinking

2. Literature Review Table on Creative Thinking 1) Discussion and exchange 2) Creating an environment 3) Self-directed learning through hands-on practice 4) Understanding rather than merely knowing 5) Challenge 6) Motivation 7) Measurable outcomes 8) Seeking valuable new alternatives The details are presented in Table 2

Table 2

Literature Review Table on Creative Thinking

Project	Chulalongkorn University Munisorn Mungkhamon. (2020). The Development of Games to Promote Creative Problem Solving.	Thammasat University Wisit Jitsawang. (2021). Learning through Games for Reflection and Internal Change.	Srinakharinwirot University Rattanaaphol Thanaphumi. (2022). The Effects of Board Games with Resource Management Mechanics on Critical Thinking.	Kasetsart University Surasak Kao-ian. (2019). The Development of Gamified Learning Activities as a Basis for Developing Divergent Thinking.	Kasetsart University Surasak Kao-ian. (2019). The Development of Gamified Learning Activities as a Basis for Developing Divergent Thinking.	KMUTT Pongphiphat Saitong. (2021). The Development of an Experiential Learning Model to Enhance Innovation Capabilities.	Silpakorn University Jiraprapa Akkharabawon. (2022). Designing Card Games to Enhance Imagination for Design Students.	Burapha University Thanarak Sarnphan. (2020). The Effects of Board Games on Reducing Fear of Failure and Increasing Achievement Motivation.	Rangsit University Chaipaporn Panichrut haiwong. (2023). Gamification Process to Develop Out-of-the-Box Thinking Skills	Naresuan University Phitiphong Pinmanee. (2021). The Development of Board Games to Enhance Cognitive Flexibility.	Frequency
Simulated Situation	✓										1
Self-Directed Learning through Hands-On Practice		✓				✓		✓			3
Limited Resources			✓								1
Measurable				✓							1
Creating New Knowledge through Play					✓						1
Sparkling Imagination to Break Traditional Thinking							✓				1
Reducing Fear of Failure / Making Mistakes									✓		1
Out-of-the-Box Thinking										✓	1

The results of the literature review analysis on creative thinking revealed that the three most frequently identified aspects were as follows. The highest-ranked aspect was creating an environment (f = 5). The second-ranked aspect was understanding rather than merely knowing (f = 3). The third-ranked aspects were discussion and exchange, self-directed learning through

hands-on practice, challenge, motivation, measurable assessment, and seeking valuable alternative solutions (f = 2)

Table 3

Percentage Analysis Table of Post-Game Evaluation Results in Educational Institutions

No .	Question Item	Percentage (%)					Overall mean score
		Non e	low	Moderate	High	Very High	
1	I can think of solutions to problems quickly.	0%	14.3 %	31%	23.8 %	31%	54.8%
2	I can generate new ideas from the materials provided.	0%	9.5%	19%	31%	40.5%	71.5%
3	I can creatively use the item cards available to solve problems.	2.4 %	11.9 %	31%	28.6 %	26.2%	54.8%
4	I understand the situations and tasks assigned to me.	0%	9.5%	23.8%	16%	47.6%	63.6%
5	I can solve problems according to the specified conditions.	0%	11.9 %	23.8%	23.8 %	40.5%	64.3%
6	I can quickly adapt my way of thinking when faced with limitations.	0%	9.5%	35.7%	23.8 %	31%	54.8%
7	I can explain my ideas to my peers in a way that they can understand.	2.4 %	9.5%	26.2%	19%	42.9%	61.9%
8	I am willing to express my opinions during the activity.	2.4 %	2.4%	14.3%	19%	61.9%	80.9%
9	I can explain the reasons for choosing a solution to a problem.	0%	4.8%	11.9%	40.5 %	42.9%	83.4%
10	I listen to the opinions of all members of the group.	0%	0%	7.1%	4.8%	88.1%	92.9%
11	I respect opinions that differ from my own.	0%	0%	7.1%	9.5%	83.3%	92.8%
12	This board game is fun and interesting.	0%	0%	14.3%	23.8 %	61.9%	85.7%
13	This board game helps develop creative thinking.	0%	0%	14.3%	19%	66.7%	85.7%
14	This board game helps develop problem-solving skills in unexpected situations.	0%	2.4%	2.8%	40.5 %	52.4%	92.9%
15	I would like to play this game again in the future.	0%	0%	21.4%	14.3 %	64.3%	78.6%

Based on the percentage analysis table of the post-game evaluation results in educational institutions, the findings can be summarized as follows:

1. Regarding the question item, "I can think of solutions to problems quickly, it was found that the sample group was able to think of solutions to problems quickly, accounting for 54.8 percent. The first rank was the very high level, accounting for 31 percent, the second rank was the moderate level, accounting for 31 percent, and the third rank was the very low level, accounting for 14.3 percent.
2. Regarding the question item, I can generate new ideas from the materials provided, it was found that the sample group was able to generate new ideas from the materials provided, accounting for 71.5 percent. The first rank was the very high level, accounting for 40.5 percent, the second rank was the moderate level, accounting for 19 percent, and the third rank was the very low level, accounting for 9.5 percent.
3. Regarding the question item, I can creatively use the item cards available to solve problems, it was found that the sample group was able to creatively use the item cards available to solve problems, accounting for 54.8 percent. The first rank was the very high level, accounting for 47.6 percent, the second rank was the moderate level, accounting for 31 percent, and the third rank was the very low level, accounting for 11.9 percent.
4. Regarding the question item, I understand the situations and tasks assigned to me, it was found that the sample group understood the situations and tasks assigned to them, accounting for 63.6 percent. The first rank was the very high level, accounting for 26.2 percent, the second rank was the moderate level, accounting for 23.8 percent, and the third rank was the very low level, accounting for 9.5 percent.
5. Regarding the question item, I can solve problems according to the specified conditions, it was found that the sample group was able to solve problems according to the specified conditions, accounting for 64.3 percent. The first rank was the very high level, accounting for 40.5 percent, the second rank was the moderate level, accounting for 23.8 percent, and the third rank was the very low level, accounting for 11.9 percent.
6. Regarding the question item, I can quickly adapt my way of thinking when faced with limitations," it was found that the sample group was able to quickly adapt their way of thinking when faced with limitations, accounting for 54.8 percent. The first rank was the very high level, accounting for 31 percent, the second rank was the moderate level, accounting for 35.7 percent, and the third rank was the very low level, accounting for 9.5 percent.

7. Regarding the question item, I can explain my ideas to my peers in a way that they can understand," it was found that the sample group was able to explain their ideas to their peers in a way that they could understand, accounting for 61.9 percent. The first rank was the very high level, accounting for 42.9 percent, the second rank was the moderate level, accounting for 26.2 percent, and the third rank was the very low level, accounting for 9.5 percent.
8. Regarding the question item, I am willing to express my opinions during the activity, it was found that the sample group was willing to express their opinions during the activity, accounting for 80.9 percent. The first rank was the very high level, accounting for 61.9 percent, the second rank was the moderate level, accounting for 14.3 percent, and the third rank was the very low level, accounting for 2.4 percent.
9. Regarding the question item, I can explain the reasons for choosing a solution to a problem, it was found that the sample group was able to explain the reasons for choosing a solution to a problem, accounting for 83.4 percent. The first rank was the very high level, accounting for 42.9 percent, the second rank was the moderate level, accounting for 11.9 percent, and the third rank was the very low level, accounting for 0 percent.
10. Regarding the question item, I listen to the opinions of all members of the group, it was found that the sample group listened to the opinions of all members of the group, accounting for 92.9 percent. The first rank was the very high level, accounting for 42.9 percent, the second rank was the moderate level, accounting for 7.1 percent, and the third rank was the very low level, accounting for 0 percent.
11. Regarding the question item, I respect opinions that differ from my own, it was found that the sample group respected opinions that differed from their own, accounting for 92.8 percent. The first rank was the very high level, accounting for 83.3 percent, the second rank was the moderate level, accounting for 83.3 percent, and the third rank was the very low level, accounting for 0 percent.
12. Regarding the question item, This board game is fun and interesting, it was found that the sample group was of the opinion that this board game was fun and interesting, accounting for 85.7 percent. The first rank was the very high level, accounting for 61.9 percent, the second rank was the moderate level, accounting for 14.3 percent, and the third rank was the very low level, accounting for 0 percent.
13. Regarding the question item, This board game helps develop creative thinking, it was found that the sample group was of the opinion that this board game helped develop creative thinking,

accounting for 85.7 percent. The first rank was the very high level, accounting for 66.7 percent, the second rank was the moderate level, accounting for 14.3 percent, and the third rank was the very low level, accounting for 0 percent.

14. Regarding the question item, This board game helps develop problem-solving skills in unexpected situations, it was found that the sample group was of the opinion that this board game helped develop problem-solving skills in unexpected situations, accounting for 92.9 percent. The first rank was the very high level, accounting for 52.4 percent, the second rank was the moderate level, accounting for 2.4 percent, and the third rank was the very low level, accounting for 0 percent.

15. Regarding the question item, I would like to play this game again in the future, it was found that the sample group expressed a desire to play this game again in the future, accounting for 78.6 percent. The first rank was the very high level, accounting for 64.3 percent, the second rank was the moderate level, accounting for 21.4 percent, and the third rank was the very low level, accounting for 0 percent.

The presentation of the percentage analysis results of the post-game evaluation in educational institutions was divided into the following sections: 1) the question item I can think of solutions to problems quickly, which found that the sample group was able to think of solutions to problems quickly; 2) the question item I can generate new ideas from the materials provided, which found that the sample group was able to think of solutions to problems quickly 3) the question item "I can creatively use the item cards available to solve problems, which found that the sample group was able to think of solutions to problems quickly 4) the question item I understand the situations and tasks assigned to me, which found that the sample group was able to think of solutions to problems quickly 5) the question item I can solve problems according to the specified conditions, which found that the sample group was able to think of solutions to problems quickly 6) the question item I can quickly adapt my way of thinking when faced with limitations, which found that the sample group was able to think of solutions to problems quickly 7) the question item I can explain my ideas to my peers in a way that they can understand, which found that the sample group was able to think of solutions to problems quickly 8) the question item I am willing to express my opinions during the activity, which found that the sample group was able to think of solutions to problems quickly; 9) the question item I can explain the reasons for choosing a solution to a problem, which found that the sample group was able to think of solutions to problems; 10) the

question item I listen to the opinions of all members of the group, which found that the sample group was able to think of solutions to problems quickly 11) the question item I respect opinions that differ from my own, which found that the sample group was able to think of solutions to problems quickly 12) the question item This board game is fun and interesting, which found that the sample group was able to think of solutions to problems quickly 13) the question item This board game helps develop creative thinking, which found that the sample group was able to think of solutions to problems quickly 14) the question item This board game helps develop problem-solving skills in unexpected situations, which found that the sample group was able to think of solutions to problems quickly and 15) the question item I would like to play this game again in the future, which found that the sample group was able to think of solutions to problems quickly.

Discussion

Guidelines for the Development of the Creative Youth Growth Board Game

1. The results of the literature review analysis on theories of creativity development revealed that simulation, self-directed learning through hands-on practice, limited resources, measurable assessment, constructing new knowledge through play, using imagination to break away from conventional thinking, reducing fear of making mistakes, thinking outside the box, cognitive flexibility, and systematic logical thinking all had the same frequency ($f = 2$)
2. The results of the literature review analysis on creative thinking revealed the three most frequently identified aspects. The highest-ranked aspect was creating an environment ($f = 5$) The second-ranked aspect was understanding rather than merely knowing ($f = 3$) The third-ranked aspects were discussion and exchange, self-directed learning through hands-on practice, challenge, motivation, measurable assessment, and seeking valuable alternative solutions ($f = 2$)
3. The percentage analysis of the post-game evaluation results in educational institutions was presented in the following aspects: (1) the question I can think of solutions to problems quickly revealed that the sample group was able to think of solutions quickly (2) the question I can generate new ideas from the materials provided revealed that the sample group was able to generate new ideas from the materials provided (3) the question I can use the item cards provided to solve problems creatively revealed that the sample group was able to use the item cards creatively to solve problems (4) the question I understand the situation and the assigned task revealed that the sample group understood the situation and the assigned task (5) the question I can solve problems

according to the given conditions revealed that the sample group was able to solve problems according to the given conditions (6) the question I can quickly adapt my way of thinking when encountering constraints revealed that the sample group was able to adapt their way of thinking quickly when encountering constraints; (7) the question I can explain my ideas clearly to my classmates revealed that the sample group was able to explain their ideas clearly to their classmates; (8) the question I am confident in expressing my opinions during the activity revealed that the sample group was confident in expressing their opinions during the activity (9) the question I can explain the reasons for choosing my problem-solving approach revealed that the sample group was able to explain the reasons for choosing their problem-solving approach (10) the question I listen to the opinions of all members in my group revealed that the sample group listened to the opinions of all group members (11) the question I respect opinions that differ from my own revealed that the sample group respected opinions that differed from their own (12) the question This board game is fun and interesting revealed that the sample group considered the board game to be fun and interesting; (13) the question This board game helps develop creative thinking revealed that the sample group considered the board game to help develop creative thinking (14) the question This board game helps develop problem-solving skills in unexpected situations revealed that the sample group considered the board game to help develop problem-solving skills in unexpected situations and (15) the question I would like to play this game again in the future revealed that the sample group expressed a desire to play the game again in the future.

Recommendations for the Application of Research Findings:

1. This research should be applied during homeroom periods once a week.
2. This research should be applied to teaching and learning activities in the classroom.

Recommendations for Future Research:

1. Further research should be conducted to develop instruments for assessing creativity
2. Research should be conducted to investigate approaches to establishing educational policies for the development of creative thinking skills.

References:

- Amabile, T. M.** (1983). *Social psychology of creativity: A consensual assessment technique.* *Journal of Personality and Social Psychology*, 45(2), 357-376.
- Guilford, J. P.** (1950). *Creativity.* *American Psychologist*, 5(9), 444-454.
- Amabile, T. M.** (1996). *Creativity in context.* Westview Press.
- Csikszentmihalyi, M.** (1996). *Creativity: Flow and the psychology of discovery and invention.* Collins.
- Sawyer, R. K.** (2012). *Explaining creativity: The science of human innovation (2nd ed.).* Oxford University Press.
- Sternberg, R. J., & Lubart, T. I.** (1995). *Defying the crowd: Cultivating creativity in a culture of conformity.* Free Press.
- Torrance, E. P.** (1974). *Torrance Tests of Creative Thinking.* Personnel Press.
- Chareonwongsak, K.** (2020). *10 Dimensions of thinking.* Success Media. [in Thai]
- Panichruttivong, C.** (2023). *Gamification process for developing out-of-the-box thinking skills.* Rangsit University. [in Thai]
- Akkarabaworn, J.** (2022). *Designing card games to promote imaginative thinking for design students.* Silpakorn University. [in Thai]
- Saraphan, T.** (2020). *Effects of using board games on reducing fear of failure and increasing achievement motivation.* Burapha University. [in Thai]
- Meemongkol, N.** (2020). *Development of board games to promote creative problem-solving thinking.* Chulalongkorn University. [in Thai]
- Jittham, P., et al.** (2022). *Designing board games to promote systemic thinking and*

innovation skills. Mahidol University. [in Thai]

Saithong, P. (2021). *Development of an experiential learning model to promote innovation capabilities. King Mongkut's University of Technology Thonburi (KMUTT). [in Thai]*

Pinmanee, P. (2021). *Development of board games to promote cognitive flexibility. Naresuan University. [in Thai]*

Thanaphum, R. (2022). *Effects of using board games with resource management mechanics on critical thinking. Srinakharinwirot University. [in Thai]*

Jitsawang, W. (2021). *Game-based learning for reflection and inner transformation. Thammasat University. [in Thai]*

Kao-ian, S. (2019). *Development of game-based learning activity packages to develop divergent thinking. Kasetsart University. [in Thai]*

Harvard University. (2023). *Project Zero: Making thinking visible. Harvard Graduate School of*

Education. <https://pz.harvard.edu>

Massachusetts Institute of Technology. (2023). *Research on creative learning. MIT Media Lab. <https://www.media.mit.edu>*

University of Cambridge. (2022). *Research on creativity and critical thinking. Faculty of Education, University of Cambridge. <https://www.cam.ac.uk>*