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Conduct a Collaborative Effort of Teachers to Strengthen Students' Creative Thinking Skills

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Abstract
This research aimed at developing the creative thinking skills of students by using Participative Action Research methodology. The research was done in two cycles, one semester each in the Academic Year of 2021. The expected results of the study should result in changes in learning and the knowledge gained from action in the specific context of the Faculty of Education of Mahamakut Buddhist University (MBU). The research participants were 15 professors, who were responsible for bachelor's degree programs in the fields of teaching the Thai language, the English language, and Social Studies. In addition, 258 students were the group targeted for development. The results showed the following expected changes. Firstly, a comparison of the mean of the participants' performance assessment and the assessment of the creative thinking skills of the students was conducted in 3 phases (before and after the first cycle and after the second cycle). For both cases, the means were higher. Secondly, the research team, co-researchers, and educational institutions learned by taking an action, especially with regard to the benefits of using participatory principles and teamwork principles, both of which make work more efficient than when individuals take an action alone. Thirdly, knowledge was gained by utilizing the conceptual framework of Force-Field Analysis, which is a model called the Driving Forces that Affect the Success of the Project entitled 'Conduct a Collaborative Effort of Teachers to Strengthen Students' Creative Thinking Skills at MBU.'

Keywords: Creative Thinking Skills, Participatory Action Research, Action-Based Learning, Knowledge Gained from Practice

1. Introduction

Mehta (2022) noted that creative thinking is a way of looking at situations, problems, or any condition from a new perspective. It **suggests unusual, unique, and unorthodox solutions.** The solutions might look unsettling in the beginning. However, they prove to be one of the most fruitful in the end. As well as, Skills You Need (n.d.) conformed that creative thinking is the ability to look at things differently, and find new ways of solving problems. Creative thinking skills are definitely not just for 'creative types' like artists and musicians. Everyone can benefit from creative thinking from time to time. This harmonizes with the definition which The Scientific World (2021), a Scientific and Technical Information Network, mentioned that creative thinking is known as thinking outside the box, as it includes lateral thinking or the ability to perceive unclear patterns in something, and creative people have the ability to devise new ways to solve problems and face challenges.

Creative thinking is very crucial as the saying goes "Everybody has a creative potential and from the moment you can express this creative potential, you can start changing the world." —*Paulo Coelho, author and lyricist*. In addition, College Success (n.d.) insisted that creative thinking (a companion to critical thinking) is an invaluable skill for college students. It's important because it helps you look at problems and situations from a fresh perspective. Creating thinking is a way to develop novel or unorthodox solutions that do not depend wholly on past or current solutions. It's a way of employing strategies to clear your mind so that your thoughts and ideas can transcend what appear to be the limitations of a problem. Creative thinking is a way of moving beyond barriers. Likewise, The Scientific World (2021) noted that creative thinking is also important for other reasons, including: providing self-awareness, provides tremendous freedom, provides courage, provides stress relief, provides improved productivity, provides bonding and teamwork, and eliminates surrender.

Naiman (2014) was founder of creativity at work and had illustrated the assumption "Can Creativity be Taught?" Yes, creativity skills can be learned; not from sitting in a lecture, but by learning and applying creative thinking processes." as well as having represented various research references over the course of the last half century, numerous training programs intended to develop creativity capacities have been proposed. In conclusion, creativity is a skill that can be developed and a process that can be managed. Creativity begins with a foundation of knowledge, learning a discipline, and mastering a way of thinking. We learn to be creative by experimenting, exploring, questioning assumptions, using imagination and synthesizing information.

Consequently, creative thinking skills are not the inherent attributes, but they are the attributes which can be improved in accordance with the five ways to improve creative thinking by Abazov (2022) as followed; 1) create your own "Three Ifs" ((a) what would happen if I change it (the object/ system/ social relationship, etc)?; (b) what would I change or improve about this object if I wanted to use it in 10 years?; and (c) what would I do if I had a one-million-dollar investment to improve it?) 2) practice dreaming, 3) make time for cohesive creative thinking, 4) learn to pitch ideas, and 5) bounce ideas off others. There, moreover, are five steps to develop creative-thinking skills by Indeed Editorial Team (2021); 1) gather what information you already have 2) consider the obvious solution or process, 3) brainstorm additional solutions., 4) consider how the topics connect, and apply the solutions. From the importance of creative thinking skills and the reasons for accepting that creative thinking is the skills which can be improved, including the attitudes and suggestions proposed by many scholars and experts in order to develop creative thinking skills in terms of principles, concepts, methods, strategies, techniques, or activities as well as the developing procedures above, the researchers aim to study creative thinking extensively and profoundly. Especially, according to the articles that the scholars, developers, researchers or notables interested in creative thinking and publishing on the internet from many countries around the world. The researchers realized that these articles were beneficial to propose and develop creative thinking variously and purposefully. In the other hand, there are some interesting aspects which should be applied in challenging development for thinking and leading to practice, using the simplicity of language for comprehensive explanation, including pictures and examples for concrete illustration. This is different from the contents in the textbooks or from the research focusing on non-variety, using difficult technical terms and not motivating learners' thinking and practice. Therefore, the researchers aim to study the literature emphasized on creative thinking with various aspects and attitudes on internet so that the researchers can apply in the project *"Conduct a Collaborative Effort of Teachers to Strengthen Students' Creative Thinking Skills"* for the undergraduate students majoring in Teaching Thai, Teaching English, and Teaching Social Studies in Faculty of Education, Mahamakut Buddhist University by employing Participatory Action Research (PAR). This methodology emphasizes on the participation and democracy to cause the changes, the learning, the body of knowledge from practice. This is bottom-up research that the researchers and the research participants work with collaboration and equal status. It is the process of planning, acting, observing, and reflecting (PAOR) in terms of a spiral cycle which has been continuously operated and it aims to changes that are expected to be sustainable developments due to the commitment to what has been done from the participatory roles at all stages (Sanrattana, 2018).

2. Research Objectives

This research aims to enhance undergraduate students' creative thinking skills who majoring in Teaching Thai, Teaching English, and Teaching Social Studies at the Faculty of Education, Mahamakut Buddhist University. PAR

method is essentially emphasized in this research in order to attain theoretical knowledge involved with creative thinking in various perspectives and attitudes. The researchers will let the research participants perceive and understand this methodology so that they can integrate it into their perspective and background knowledge. As a result, this can develop and strengthen creative thinking skills as the principle "Theory and practice should be interwoven, and for this reason it is useful to think of the process as braiding a rope where the two aspects are continually connected together" (Flinders University, 2022). In this research, there are two groups of participants; the first group is 15 instructors in charge of courses in three majors, the second is 258 students. The expectations in this research are to 1) increase the research participants' changes in the level of performance and the students' creative thinking skills by considering the comparative evaluation in three phases; pre-cycle performance 1, post-cycle performance 1, and post-cycle performance 2, 2) provide learning from the researchers' self-performance, the research participants, and the self-performance of educational institute and 3) procure the body of knowledge form performance in term of grounded theory in the specific context for the Faculty of Education, Mahamakut Buddhist University.

3. Literature Review

Due to the perspectives which the focus of this research was to scrutinize the literature review in order to achieve theoretical knowledge involved with creative thinking in various points and perspectives, the researchers had studied six theoretical perspectives about creative thinking as followed;

1. The definition of creative thinking skills from the view of Abazov (2022), College Success (n.d.), Indeed Editorial Team (2021), Mehta (2022), Naiman (2014), Skills You Need (n.d.), and The Scientific World (2021).
2. The importance of creative thinking skills from the view of Brainstorming (n.d.), Childs (2019), College Success (n.d.), Doyle (2020), Inkbot Design (2020), Mcnamara (2022), The Peak Performance Center (n.d.), and The Study Space (n.d.).
3. The characteristics of creative thinking skills from the view of Alisha (n.d.), Carson (n.d.), Delex (2018), Ho (n.d.), and Mossing (2013).
4. The development of creative thinking skills from the view of Abazov (2022), Cherry (2019), Cherry (2022), Gellerman (2016), Jacqelinerl (2013), Mckinney (2016), Pontefract (2018), Tracy (n.d.), Tutorials Point (2019), Weareholst (2017), and Wilson (n.d.),
5. The developmental procedures of creative thinking skills from the view of Kirst. (2017), Davis (2018), Gorfien (2020), Indeed Editorial Team (2021), and The Master Class staff (2021).
6. The evaluation of creative thinking skills from the view of Creativity Questionnaire (n.d.), Survey Monkey (2020), and Test My Creativity (n.d.).

According to studying six perspectives in literature review, it likely seems that the developmental perspectives (principles, concepts, techniques, methods, and activities) are the essential body of knowledge because they can reveal various developmental directions to make the project *"Conduct a Collaborative Effort of Teachers to Strengthen Students' Creative Thinking Skills"* more effective. Therefore, the developmental directions (principles, concepts, techniques, methods, and activities) can be concluded into 34 points; 1) establishing creative rituals, 2) changing mindset, 3) deliberate thinking, 4) asking better questions, 5) build a network, 6) take risks, 7) build confidence, 8) overcome negative attitudes that block creativity, 9) travel to other places, 10) need inspirational rituals, 11) be open to new things, 12) creative confidence, 13) explore media outside comfort zone, 14) create something small every day, 15) figure out peak hours, 16) keep a journal, 17) seek out inspiration, 18) commit to developing creativity, 19) seeking outside help, 20) reach out to likeminded people, 21) ask for feedback, 22) create a mind map and flow chart, 23) reward curiosity, 24) have fun with colleagues or friends, 25) try the "six hats" technique, 26) try to create something every day, 27) make a list and select ideas, 28) try the snowball technique, 29) socialize regularly, 30) listen to music while work, 31) unwind by watching funny content, 32) start with a morning free write, 33) brainstorm to inspire new ideas, and 34) ask the right questions.

4. Research Methodology

4.1. Types of Action Research

Carr and Kemmis (1992) classified action research into three types as followed; （1） Technical Action Research which a researcher seems to be an outside expert having the research participants practice his or her concepts, roadmap, or projects, （2） Practical Action Research which a researcher will have more participation with the research participants in research, he or she will not have the research participants practice his or her concepts, roadmap, or projects but tends to be an advisor, or a stimulator to raise an issue or facilitate in terms of collaboration, practice, observation, and reflection, （3） Emancipatory Action Research / Participatory Action Research which a researcher will equally participate and collaborate with the research participants in doing research.

In this research, Participatory Action Research (PAR) method was employed. As can be seen in a study of Sanrattana (2018) cited in a considerable amount of literature of Arhar, Holly and Kasten (2001), Carr and Kemmis (1992), Coghlan and Brannick (2007), Creswell (2008), James, Milenkiewicz and Bucknam (2008), Kemmis and McTaggart (1992), McTaggart (1991), McTaggart (2010), and Mills (2007), it founds that the concept of PAR methodology is identical to Critical Social Theory and Theories of Postmodernism which emphasize on participation and democratization in the actions and consequences that cause change, learning, and knowledge from the action. It consists of bottom-up, collaboration, and equally planning, acting, observing, and reflecting in a spiral cycle manner that operates endless moves.

4.2. Cycles Steps and Ethics of the Study

As mentioned above, PAR methodology was conducted in the manner of a spiral cycle that is carried out in an endless sequence of planning, acting, observing, and reflecting results. Due to a limit on the course duration, the researchers had to establish two cycles for this study, one semester each in the academic year 2021. The details of each cycle are as follows.

4.2.1. Cycle 1

Step 1 Preparation. It included three activities as follows: 1) clarify research methods for the research participants so that they can decide to participate voluntarily according to the followings code of conduct, "(1)The researcher must initially demonstrate the nature of the research process and its interests to the research participants, and " (2) those who do not wish to participate must be respected for their rights.", 2) design ethical collaboration: "(1) engage participants in the design of the research process, and (2) create joint consultation and common approval between all parties" and 3) conduct an after-action review "(1) analyze, critique, and assess oneself; and (2) learn from action both successful and unsuccessful under the systematic joint learning process."

Step 2 Planning. It included four activities: 1) conduct brainstorming among research participants to find out what and how to improve the students' creative thinking skills in accordance with the research participants' prior knowledge and experience considering the potential expertise and being a stakeholder from within the community, 2) the researchers present the theoretical development guidelines from the results of the relevant literature studies to the research participants so that they can equally access various information, 3) make an action plan by brainstorming to integrate the co-designated development approaches and theoretical developmental directions from the relevant literature studies based on all parties' opinions and create joint consultation and formal approval between all parties (Note: the action plan resulted in 44 joint development guidelines between the researchers and the research participants as shown in Table 1, and 4) conduct an after-action review.

Step 3 Acting. It included four activities: 1) create the evaluation form for implementation of alternative proposals by research participants and the evaluation form for the development of the students' creative thinking skills in order to evaluate three phases; pre-action and post-action in Cycle 1 and post-action in Cycle 2 based on the concept of research direction and expected outcomes resulted by joint decisions, 2) evaluate the current condition of pre-action in Cycle 1 by using the evaluation form for implementation of alternative proposals by research participants and the evaluation form for the development of creative thinking skills, and 3) follow the joint action plan considering "(1) in a specific context, (2) diversified skills, (3) change-oriented, (4) action-oriented, and (5)

sustainable development." and based on the concept "each research participant influences work," and 4) conduct an after-action review.

Step 4 Observing. It was a phase of data collection from every activity and action by using an observation form, an in-depth interview, and group interview, examining or record such as journal, maps, audiotapes and videotapes, artefacts, and field notes based on the concept of "There is a record of all research participants' activities and actions," and ethical considerations "(1) any observation or review of documents for any other purpose must be authorized, and (2) no copyright infringement of the writings is required or the views of others without negotiating before publication"

Step 5 Reflecting. It included three activities: 1) evaluate the current condition of post-action in Cycle 1 by using the evaluation form for implementation of alternative proposals by research participants and the evaluation form for the development of the students' creative thinking skills, 2) reflect on performance by brainstorming to reflect on the results of every step of Cycle 1 using the concepts of "(1) listen to all research participants' opinions (2) analyze, critique, and assess oneself and (3) learn from action both successful and unsuccessful under the systematic joint learning process." and the concept "the results will remain visible and allow others to give feedback.", and 3) conduct an after-action review.

Kurt Lewin's Force-Field Analysis (Lunenburg & Ornstein, 2000) was applied in this step. The analysis covered the following aspects: a) What is the force for change?; b) To what extent has the force changed the expectation?; c) What are the resistances to change?; and d) What are suggestions to effectively increase the force and reduce the resistance to change?. The findings were used for making an action plan in step 6. The plan might either improve the original force's efficacy or replace it with a more effective force, or both.

4.2.2. Cycle 2

Step 6 Planning. It included two activities: 1) action plan and 2) conducting after-action review.
Step 7 Acting. It included two activities: 1) follow the joint action plan made in step 6, and 2) conduct after-action review.
Step 8 Observing. It included data collection from activities using an observation form, an in-depth interview or group discussion, examining/record as used in Cycle 1.
Step 9 Reflecting. It included three activities: 1) evaluate the current condition of post-action in Cycle 2 using the evaluation form for the co-designated development approaches implementation and the evaluation form for the students' development of creative thinking skills, 2) reflect on performance by brainstorming to reflect on the results of every step of Cycle 2, and 3) conduct an after-action review.
Step 10 Research result conclusion. The researchers and research participants attended the workshop to summarize the data collected from the above steps. The conclusion was drawn upon the principles of "(1) specific context, (2) recognize every research participant's opinion, (3) analyze, critique, and assess oneself; and (4) learn from action both successful and unsuccessful under the systematic joint learning process", and "(1) create joint consultation and common approval between all parties and (2) the results will remain visible and allow others to give feedback."

4.3. Research site and research participants

The Faculty of Education at Mahamakut Buddhist University was the research site. It was selected explicitly considering its convenience, the potential of the researchers and the possibility of obtaining cooperation from the research participants. It is an educational institution under the Ministry of Higher Education, Science, Research and Innovation, located in Salaya Subdistrict, Phutthamonthon District, Nakhon Pathom Province, Thailand. 15 teachers who voluntarily participated after hearing the research method and 258 students were the targets for development.

4.4 Research tools

1) The data collection form was selected according to the circumstances of the activities and actions as suggested in the concept of Mills (2007) as follows: 1) an observation form, 2) an in-depth interview and group discussion, and 3) examining/record or journal, maps, audiotapes and videotapes, artifacts, field notes, etc.

2) The evaluation form for the co-designated development approaches implementation was used to evaluate the 3-phase current condition (pre-action, post-action in Cycle 1 and post-action in Cycle 2). The research participants' self-assessment with a 5-rating scale: the most, very, neutral, a little and the least. Because the questions in the form were related to the co-designated development approaches and theoretical developments from relevant literature studies synthesized by the researchers and research participants in Cycle 1 (Action Plan), this assessment was not examined by experts for content validity and item-objective congruence indexes, nor was it used in a try-out with the sample group for its alpha coefficient of reliability.

3) The evaluation form for the students' creative thinking skills created by the researchers and research participants was the self-assessment for the target group from the findings in the creative thinking skills studies of Alisha (n.d.), Carson (n.d.), Delex (2018), Ho (n.d.), and Mossing (2013) as well as the result of evaluating approach studies involved with creative thinking skills due to Creativity Questionnaire (n.d.), Survey Monkey (2020), and Test My Creativity (n.d.). it was characterized by a rating scale of 5 levels: the most, very, neutral, a little and the least, with a total of 30 questions.

This assessment was reviewed for the Indexes of Item-Objective Congruence (IOC) based on Rovinelli and Hambleton (1977) by five educational administration and educational measurement and assessment experts. The results showed that all questions have an IOC value above the 0.50 threshold. Therefore, all items indicated that this assessment had content validity (Chaichanawirote & Vantum, 2017). The findings, in a try-out with 30 students in the Faculty of Education, Mahamakut Buddhist University, Isan Campus, showed an alpha coefficient of reliability value of .95. When classified by aspects, it was found that the asking creative questions was .86, the creative idea generation was .89, and the flexibility in thinking and practice was .85, which was higher than the specified threshold (equal to or higher than 0.70) (UCLA: Statistical Consulting Group, 2016).

4.5. Data Collection and Analysis

The researchers and research participants played a role in collecting data at every step by using the tools mentioned above, following the principles "There is a record of all research participants of their activities and actions."

Quantitative data from both forms of self-assessment were analyzed using descriptive statistics, i.e. mean and standard deviation. Qualitative data, which was actual data obtained through observations, interviews and recordings, were analyzed in the followings process: 1) Checking the integrity of the data to determine whether it is entirely objective or not, 2) Checking the reliability of the data to see if it meets the actual conditions by comparing each one's recording and comparing the recording based on using the different data collection forms, and 3) Presenting information in a thick and critical description regarding the story telling factually and neutrally with evidence of subtitles such as numbers, statistics, table, graphic, photograph, and direct quotes/verbatim or the informant's unadjusted dialogue pointing to a wide range of thoughts on the same issue that may support or contradict each other.

5. Research Results

5.1. Changes in expected outcomes

1) increase the research participants' changes in the level of performance and the students' creative thinking skills by considering the comparative evaluation in three phases; pre-cycle performance 1, post-cycle performance 1, and post-cycle performance 2, 2) provide learning from the researchers' self-performance, the research participants, and the self-performance of educational institute and 3) procure the body of knowledge form performance in term of grounded theory in the specific context for the Faculty of Education, Mahamakut Buddhist University.

As mentioned above, the objectives of the project *"Conduct a Collaborative Effort of Teachers to Strengthen Students' Creative Thinking Skills"* for the undergraduate students within three majors (Teaching Thai, Teaching English, and Teaching Social Studies) is to increase the research participants' changes in the level of performance and to increase the undergraduate students' level of creative thinking skills by considering the results of comparative evaluation in three phases i.e. pre-action and post-action in Cycle 1, and post-action in Cycle 2.

In expectation case 1, due to the results of evaluating the level of the development approaches involved with principles, concepts, techniques, methodologies, and activities that the research participants had implemented in three phases, it found that the mean was increasingly of $3.08, 3.29$, and 3.37 respectively; it indicated that the research participants had increasingly and respectively implemented the development approaches. In addition, the results showed that standard deviations were decreasingly and respectively of $1.00, 0.85$ and 0.84. this indicated that the expression of the research participants' opinions in each phase was lowly fluctuating as the data analysis shown in the table 1 below.

Table 1: Changes in the Implementation of the Development Approaches Comparing mean and Standard Deviations Derived from the Research Participants' Evaluation in Three Phases: Pre-Action and Post-Action in Cycle 1 and Post-Action in Cycle 2

The Lists of Principles, Concepts, Techniques, Methodologies, and Activities in Expectation of the Research Participants' Implementation with the Undergraduate Students	Assessment Results from pre-action in Cycle 1		Assessment Results from post-action in Cycle 1		Assessment Results from post-action in Cycle 2	
	$\overline{\chi}$	S.D.	$\overline{\chi}$	S.D.	$\overline{\chi}$	S.D.
1. Practice Thinking Outside the Box	3.07	0.92	3.36	0.84	3.07	0.92
2. Practice Making Mistake	3.07	1.14	3.07	1.14	3.07	1.14
3. Practice Having a Sense of Humor	3.21	0.58	3.21	0.58	3.21	0.58
4. Practice Paying Attention to Surroundings	3.29	1.07	3.50	1.09	3.29	1.07
5. Encourage Participation in Work	3.21	0.89	3.21	0.89	3.21	0.89
6. Encourage Curiosity	3.57	1.50	4.21	0.89	3.57	1.50
7. Build Good Habits at Work	3.57	0.85	3.64	0.84	3.57	0.85
8. Make Imagination Become True	3.36	0.84	3.71	0.73	3.36	0.84
9. Practice Being Open-Minded for Change	3.86	0.77	3.86	0.77	3.86	0.77
10. Have Courage to Face the Truth	3.64	1.01	3.64	1.01	5.00	0.00
11. Establish Creative Rituals	4.36	1.01	3.64	1.01	3.64	1.01
12. Change Mindset	3.64	0.74	4.36	0.74	4.36	0.74
13. Deliberate Thinking	3.86	0.74	3.71	0.61	3.64	0.74
14. Asking Better Questions	3.50	1.29	4.07	1.00	3.86	1.29
15. Build a Network	3.43	0.65	3.50	0.65	4.43	0.85
16. Take Risks	3.29	1.09	3.71	0.91	3.43	1.09
17. Build Confidence	3.29	1.20	3.64	0.93	3.29	1.20
18. Overcome Negative Attitudes that Block Creativity	2.57	0.83	3.29	0.83	3.29	0.83
19. Travel to Other Places	3.00	1.02	3.14	0.77	3.00	0.55
20. Need Inspirational Rituals	2.71	1.11	3.29	0.73	4.36	0.74
21. Be Open to New Things	2.79	1.20	3.29	0.91	3.29	0.83
22. Creative Confidence	2.79	0.80	3.07	0.83	2.93	0.62
23. Explore Media Outside Comfort Zone	2.71	1.25	3.36	1.22	3.07	0.92
24. Create Something Small Every Day	2.57	1.07	3.21	0.89	2.86	0.86
25. Figure Out Peak Hours	2.29	0.94	3.14	1.03	2.79	0.70
26. Keep a Journal	2.86	1.14	2.86	1.10	2.64	0.93
27. Seek out Inspiration	2.79	1.17	3.14	0.86	3.14	0.95
28. Commit to Developing Creativity	2.86	1.05	3.07	0.73	3.29	0.91
29. Seeking Outside Help	2.64	1.03	3.00	0.88	2.93	0.92

The Lists of Principles, Concepts, Techniques, Methodologies, and Activities in Expectation of the Research Participants' Implementation with the Undergraduate Students	Assessment Results from pre-action in Cycle 1		Assessment Results from post-action in Cycle 1		Assessment Results from post-action in Cycle 2	
	$\bar{\chi}$	S.D.	$\bar{\chi}$	S.D.	$\bar{\chi}$	S.D.
30. Reach out to Likeminded People	2.71	1.01	2.86	0.66	3.14	0.66
31. Ask for Feedback	2.86	1.20	2.86	1.03	3.07	1.00
32. Create a Mind Map and Flow Chart	2.64	1.03	3.00	0.88	3.00	0.88
33. Reward Curiosity	2.71	0.84	2.71	0.73	2.79	0.70
34. Have Fun with Colleagues or Friends	3.00	0.61	2.79	0.43	2.86	0.36
35. Try the "Six Hats" Technique	3.29	0.88	3.07	0.73	3.14	0.66
36. Try to Create Something Every Day	2.93	1.14	3.43	0.85	3.71	0.73
37. Make a List and Select Ideas	2.86	1.14	3.07	0.92	3.21	0.80
38. Try the Snowball Technique	3.14	0.86	2.86	0.86	4.11	0.77
39. Socialize Regularly	3.14	0.95	3.14	0.95	3.14	0.95
40. Listen to Music While Work	2.29	1.10	3.36	0.74	4.21	0.89
41. Unwind by Watching Funny Content	2.64	0.91	2.36	0.74	2.86	0.95
42. Start with a Morning Free Write	2.86	1.01	2.93	0.73	3.00	0.68
43. Brainstorm to Inspire New Ideas	3.00	1.29	3.00	1.11	3.07	1.07
44. Ask the Right Questions	3.07	1.04	3.36	0.63	3.36	0.63
Total	**3.08**	**1.00**	**3.29**	**0.85**	**3.37**	**0.84**

In expectation case 2, due to the evaluation of 258 students' creative thinking skills in the three phases, it showed that the mean was respectively higher; the overall mean was 2.97 from pre-action in Cycle 1; 3.90 form post-action in Cycle 1; and 4.09 from post-action in Cycle 2. It represents a gradual improvement of the students' creative thinking skills. Furthermore, considering the low overall standard deviation of 0.96, 0.65 and 0.53, respectively. This represents that the students' opinion expression are lowly fluctuating as the data analysis shown in the table 2 below.

Table 2: Comparing the Evaluation Results of the Students' Creative Thinking Skills in Three Phases: Pre-Action and Post-Action in Cycle 1 and Post-Action in Cycle 2

Expected Characters/Attributes of Creative Thinking Skills Which Happen to the Students	Assessment Results from pre-action in Cycle 1		Assessment Results from post-action in Cycle 1		Assessment Results from post-action in Cycle 2	
	$\bar{\chi}$	S.D.	$\bar{\chi}$	S.D.	$\bar{\chi}$	S.D.
Asking Creative Questions	3.00	0.90	4.00	0.58	4.00	0.71
1. I ask a question to enhance creativity.	2.93	0.73	4.43	0.51	4.50	0.52
2. I practice my thinking skills without limitations.	2.86	1.03	4.14	0.53	4.57	0.51
3. I practice mind modification.	3.07	0.47	4.29	0.47	4.14	0.77
4. I admit my mistakes.	2.71	0.83	3.86	0.77	3.93	0.62
5. I learn all the time.	3.14	0.86	3.86	0.53	3.57	0.65
6. I have a goal to be a creative thinker.	3.43	1.45	4.29	0.47	4.29	0.83
7. I learn to get rid of my ego (self-attachment).	3.43	0.76	4.43	0.51	4.64	0.50
8. I firmly believe that creativity can be developed.	3.29	0.73	4.14	0.66	4.21	0.43
9. I have enough classrooms to learn different styles.	3.50	0.76	4.14	0.36	3.71	0.61
10. Setting up the atmosphere in my faculty promotes creative behaviors.	3.36	1.01	3.86	0.66	3.71	0.83
Creative Idea Generation	3.01	1.01	3.74	0.66	3.98	0.69

Expected Characters/Attributes of Creative Thinking Skills Which Happen to the Students	Assessment Results from pre-action in Cycle 1		Assessment Results from post-action in Cycle 1		Assessment Results from post-action in Cycle 2	
	$\overline{\chi}$	S.D.	$\overline{\chi}$	S.D.	$\overline{\chi}$	S.D.
11. I create ideas or solutions to various problems and questions.	3.43	1.02	4.14	0.77	4.57	0.76
12. I am often judged as out of order.	3.36	1.01	3.71	0.91	4.36	0.50
13. I'm curious about things.	3.29	0.73	3.71	0.61	4.86	0.36
14. I have the correct workflow for troubleshooting.	3.43	1.28	4.00	0.68	4.21	0.43
15. I will not ask a question if the question has no answer.	3.21	0.80	3.36	0.50	4.14	0.36
16. I sometimes express my opinion.	3.00	1.04	4.07	0.73	3.93	0.47
17. I have a new presentation.	2.71	1.27	3.86	0.53	4.00	0.00
18. I am enthusiastic about things.	2.79	0.70	4.00	0.39	3.50	0.52
19. I enjoy coming up with new ideas, even without pay.	2.57	1.02	3.43	0.51	3.00	0.55
20. I can change my attention to get the job I want.	2.86	0.95	3.57	0.51	3.29	0.61
21. I enjoy being aware of others.	2.57	1.02	3.36	0.50	3.93	0.27
Flexibility in Thinking and Practice	2.69	1.02	3.83	0.87	4.14	0.36
22. I am creative and playful but self-disciplined.	2.71	0.71	4.07	0.83	4.14	0.36
23. I am creative and proud-hearted, but simple.	2.79	1.25	4.14	0.77	4.21	0.53
24. I am creative and heedful to the outside world as well as my own feelings.	2.71	1.07	3.57	0.65	4.14	0.58
25. I am creative and heedful and have my own purpose in working.	2.57	0.94	3.64	0.63	4.14	0.66
26. I'm a conservative in some ways.	2.29	1.14	4.29	1.27	4.14	0.66
27. There is always someone asking my suggestion.	2.86	1.17	3.64	0.63	4.14	0.66
28. I was urged to respond with contradicting messages.	2.79	1.05	3.43	0.76	4.07	4.07
29. I'm not satisfied when my work doesn't go as expected.	2.86	1.03	3.36	0.84	4.64	0.50
30. I am a prudent person.	2.64	1.01	4.36	0.84	4.07	0.27
Total	**2.97**	**0.96**	**3.90**	**0.65**	**4.09**	**0.53**

However, in accordance with the reflection activities in Cycle 1 and Cycle 2, it reveals that this research positively breeds the unexpected change i.e., 15 research participants have been interested and enthusiastic in activity participation before because this research challenges their ability and encourage them to work friendly as well as applying Buddhist Dhamma in research. Moreover, the research participants have learned that collaboration increases efficacy more than individual work. Additionally, the students increasing show their habits of daring to express thinking, action, opinion properly and creatively. They express more shared responsibilities as well as they can present their work confidently; accordingly, these proficiently create an atmosphere that is conducive to teaching and learning.

5.2 Action-based Learning

According to the findings, the researchers, research participants, and educational institutions all benefited in various ways from this participatory action research. However, an essential lesson that we shared was understanding the benefits of collaboration. In addition, the PAR methodology used in this study permits all parties to perceive the inefficiencies of the uncoordinated work we had conducted in the past.

According to the findings, the researchers realized that collaboration can increase learning exchange and success more effective than working individually because it encourages all the participants to collaborate in analyzing and planning to solve problems. Additionally, Buddhist Dhamma integration at work has improved collaboration because Buddhist Dhamma affects human beings' righteous behaviors. It helps people collaborate happily, promote unity among the group, develop working styles, and support the researchers' success and progress.

On the other hand, the research participants had learned the mindset change from the development approaches based on principles, concepts, techniques, methods, and activities depending on what one has learned and experienced to be the study of body of knowledge which is new and theoretical in order to break free from former limitations and to improve thinking outside the box.

In case of the faculty of education, the research participants have recognized the importance of administration based on the collaboration or the democratic principles, applied in developing or learning and teaching management, which result in the effectiveness more than the command and interpersonal work that has been done before.

5.3. Knowledge from Action

A body of knowledge gained from practice is based on Kurt Lewin's Force-Field Analysis in order to show what the driving force used for causing changes is, to what extent the driving force causes the expected changes, what change resistance occurs, what guideline from the change resistance is the suggestions to effectively increase the driving force and to decrease those change resistance as mentioned below.

In case of what the driving force used for causing changes is, it can be considered form what the researchers and the research participants have done as followed; 1) the application of principles, concepts, and research ethics in PAR methodology, especially the emphasis on bringing out the potential of research participants to the best, and then supplemented by principles and theoretical concepts the researchers have already studied; 2) determining "the pre-cooperation principles" encourage the research participants to cooperate in harmony and right direction. Those principles consist of open communication, persuasion and influencing, facilitation, encouraging free thinking and speaking, don't forget the fun factor, and having feedback; 3) determining "pre-working collaboration strategies" allows the research participants to work together in the same direction. The strategies comprise (a) clearly defined goals (b) relaxation leads to the implementation of ideas (c) formal and informal communication with the team as a leader (d) creating a productive work environment (e) be creative, and (f) meet outside the workplace. 4) determining "the procedures for bringing jointly determined alternative proposals to action" allows the research participants to systematically work as followed; (a) deep insights into the wide variety of proposing alternatives (b) bringing the chosen alternatives to action in the course taught or the work performed (c) bringing the results of individual action to group discussion periodically and (d) doing a workshop to present the results of individual development at the end of each cycle and 5) applying "the Buddha's teachings" allow the research participants to realize the quality and success in working. In this paper, the researchers emphasize on the following Buddha's teachings; Sangahavatthu (bases of social solidarity) is to support and enhance human unity, Iddhipàda (path of accomplishment) is to encourage one to have will, effort, and dedication in working with wisdom, Brahmavihàra (sublime states of mind) consists of loving-kindness, compassion, sympathetic joy, and equanimity, as well as Sappurisa-dhamma (qualities of a good man) is the Buddha's teaching which raises awareness of truth, purpose, selfness, sufficiency, time, community, and individual differences.

In addition, to what extent the driving force causes the expected changes can be seen from; 1) the results of evaluating the level of the development approaches involved with principles, concepts, techniques, methodologies, and activities that the research participants had implemented in three phases revealed that the mean was increasingly of 3.08, 3.29, and 3.37 respectively. It indicates that the research participants had increasingly and respectively implemented the development approaches; and 2) the students' results of evaluating the creative thinking skills in three phases indicates higher mean respectively i.e. the mean arises at 2.97 on pre-action in Cycle 1, and increases at 3.90 on post-action in Cycle 1, and then expands to 4.09 on post-action in Cycle 2. This represents that the development has respectively improved the changes.

The following are the primary change resistance factors and ways to overcome them. It can be considered from the conduct of after-action review and the reflection activities which reveals the factors of important change resistance are; 1) both the researchers and the research participants occasionally had misunderstandings from the principles, concepts and ethics of the PAR methodology. This requires periodic revisions to ensure consistent understanding. 2) the research participants had inconsistent free time, causing delays in the lesson transcription

and reflection activities. This led to bringing online meetings to be used in conjunction with onsite meeting. 3) The researchers still lacked skills in applying the action results of each stage to write a research report in a story telling style; consequently, the delays had occurred and the researchers had to study more samples from previous research of other researchers.

6. Discussion

As mentioned above, Carr and Kemmis (1992) classified action research into three levels: (1) Technical Action Research, the main concept is that a researcher pretends to be an outside expert who brings concepts, plans, or projects initiated or created by him or her to a research participant to act. (2) Practical Action Research, the main concept is that a researcher is more involved with a research participant; do not have a research participant act on his or her concepts, plans, or projects as the first level. The researcher will act as an advisor who motivates, raises issues, and directs the research participant to collaboratively think, act, observe the results, and make a reflection. (3) Emancipatory Action Research / Participatory Action Research, the main concept is the collaboration between a researcher and research participant in doing research. They are both equal in status to brainstorm, to act, to observe, and to reflect.

Sanrattana (2018) argued that Technical Action Research is critically Top-Down research which a research participant seems to be a passive follower. It can be compared to the organization administration used Theory X or Immaturity Organization or System 1. If considering the leadership styles, it can be compared to boss-centered leadership (telling, directing, controlling or job-centered). The Technical Action Research, furthermore, is also characterized as a research method on them that aims to understand or to seek knowledge in existing phenomena. The researcher's role is an expert doing research with participants. When having received the expected results, he or she will abandon participants and troublesomeness. There has been no benefit or change of any kind from the research. On the contrary, the researcher will receive benefits such as career advancement, payoff, reputation and so on. If compared with the management style in government agencies, such research appears to be very similar to the management style that has been used in the past. Especially, on issues where executives show themselves to be experts or knowledgeable, playing a role as a person who determines the problem or needs and how to manage it with staff, such habit can cause the lack of creativity, enthusiasm, seriousness in work. Due to having to wait for orders or always to rely on the opinions of those who are superior, this results in the lack of sustainability in administration as can be seen from many projects disrupted when changing a new executive.

From negative viewpoints towards Technical Action Research, researchers are more interested in PAR methodology because it is Bottom-Up research in which both researchers and research participants are equal in expressing opinions and practices. Therefore, it is highly democratic. Both of them can play roles as an actor or a leader. If compared with the management theory, this methodology can be compared with Theory Y or Maturity Organization or System 4. If considering the leadership styles, it can be compared to practitioner-centered leadership (participating, delegating, colleague, or employee-centered).

In conclusion, the implementation of PAR methodology shifts all subjects from being passive to active as participants. In other words. It changes from research on them to research by them or for them; that is the subjects will participate in every section as decision makers, actors, and beneficiary. Besides, researchers' role will be changed from outside experts to be equal research participants. The research purpose is not only to understand or perceive phenomena but also to take action in order to bring about the change in the desired direction. It is also expected that this change will be sustainable regarding the commitment made by the participatory roles in all sections. This concept is not only associated with organizational Theory and leadership Style but also several theories applied in educational administration. For example, *"School-based management"* is the systematic decentralization to the school level of authority and responsibility to make decisions on significant matters related to school operations within a centrally determined framework of goals, policies, curriculum, standards, and accountability (Caldwell, 2005), **"*Democratic leadership*"**, also known as participative leadership or shared leadership, is a leadership style in which members of the group participate in the decision-making process. This type of leadership can apply to any organization, from private businesses to schools to the government. (Cherry, 2022), and *"Change management"* is a systematic approach to dealing with the transition or transformation of an organization's goals, processes or technologies (Lawton & Pratt, 2022). Accordingly, research, development, or

administration in the present day is the initial phase in the 21st century emphasizing on democratic working principles more than in the past. If expecting the change in the desired direction and the sustainability, researchers should employ PAR methodology as much as possible because it seems to be the co-implementation of organizational management theory, educational administration theory, and leadership theory.

7. Recommendations

Similarly to "Participatory Practice "Teach Less, Learn More": A Case of Srikranuanwittayakom School" (Roobtam & Sanrattana, 2021), "Development of Learning by E-Learning System: A Case of Mahamakut Buddhist University, Mahavajiralongkorn Rajaviyalaya Campus" (Uttamadhammo & Sutheejariyawattana, 2021), "Cooperative practices to enhance the quality of work integrated learning at Nong Khai Technical College" (Sarapoom & Dhammapissamai, 2021) and "Teachers and participatory action research for developing learning environments" (Thawinwong & Sanrattana, 2022), all these papers had revealed the new body of knowledge from action based on the concept of Force-Field Analysis, being the prototype model for development, as well as being the spiral cycle or a case study model so that other agencies can adapt or apply. Therefore, this research recommendation is to present the model elements that result in the successful collaboration of teachers to enhance students' creative skills in the case of the faculty of education, Mahamakut Buddhist University as illustrated below.
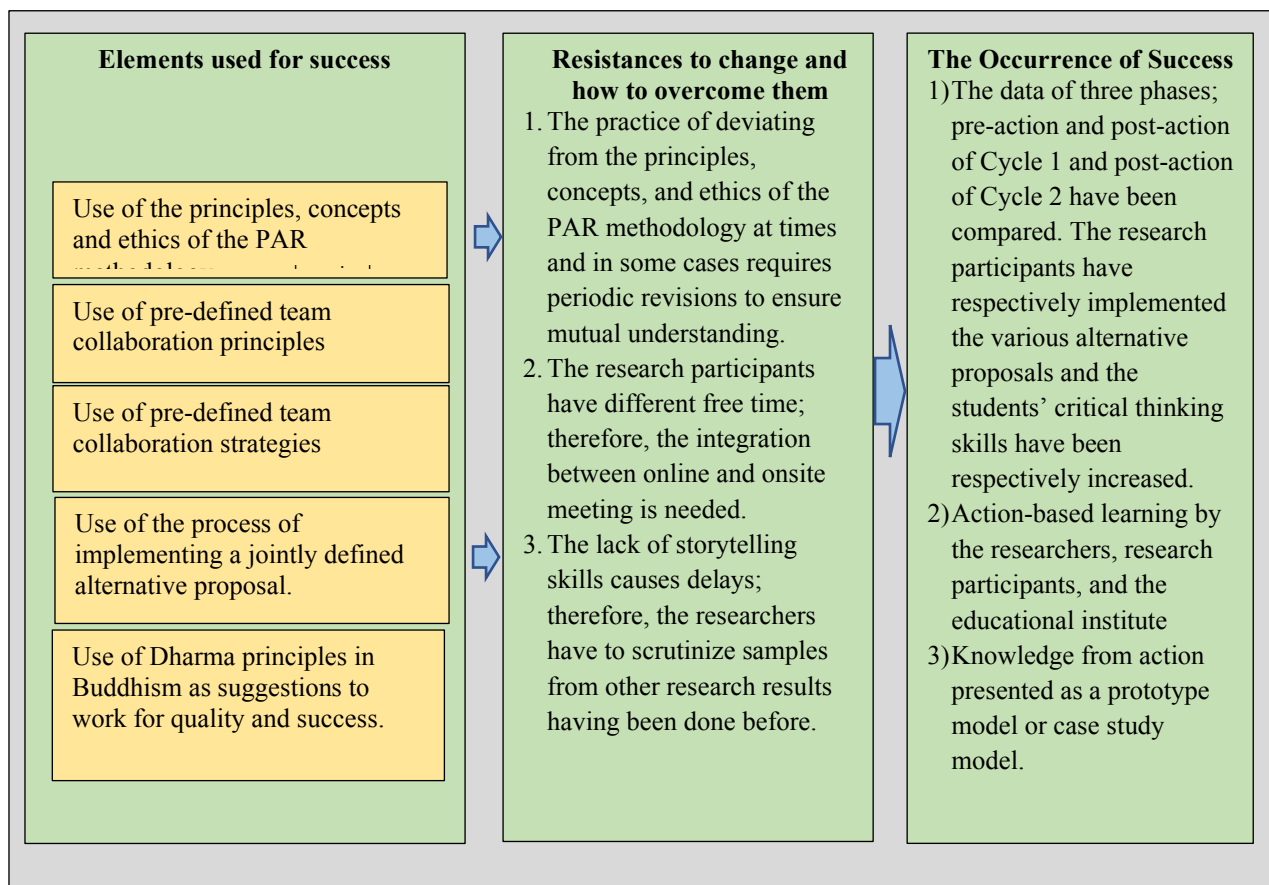
Elements used for success	**Resistances to change and how to overcome them**	**The Occurrence of Success**
Use of the principles, concepts and ethics of the PAR methodology...	1. The practice of deviating from the principles, concepts, and ethics of the PAR methodology at times and in some cases requires periodic revisions to ensure mutual understanding.	1) The data of three phases; pre-action and post-action of Cycle 1 and post-action of Cycle 2 have been compared. The research participants have respectively implemented the various alternative proposals and the students' critical thinking skills have been respectively increased.
Use of pre-defined team collaboration principles	2. The research participants have different free time; therefore, the integration between online and onsite meeting is needed.	2) Action-based learning by the researchers, research participants, and the educational institute
Use of pre-defined team collaboration strategies	3. The lack of storytelling skills causes delays; therefore, the researchers have to scrutinize samples from other research results having been done before.	3) Knowledge from action presented as a prototype model or case study model.
Use of the process of implementing a jointly defined alternative proposal.		
Use of Dharma principles in Buddhism as suggestions to work for quality and success.		

Figure 1: The Driving Forces that Affect the Success of the Project entitled 'Conduct a Collaborative Effort of Teachers to Strengthen Students' Creative Thinking Skills at MBU.'

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