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The Development of the Integrated STEAM Approach Using Social Service Learning to Address Students' Creativity

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Abstract

This research aimed to develop an integrated STEAM approach using social service learning to address students' creativity. The research is conducted using R&D methodology with 3 phases; Phase 1: Analysis of documents and concepts Theory Research related to the integrated STEAM approach using social service learning Phase 2 Create a integrated STEAM approach using social service learning, and Phase 3: Study the results of using an integrated STEAM approach using social service learning. The sample is a network of STEM schools in Roi Et province, Thailand. One school was drawn using the school as a random unit, and there were 30 students in the product design course offered in the second semester of the academic year 2023. The tools used to collect data include a integrated STEAM approach using social service learning, a measure of creativity from the artworks of students learning with art activities using the behavioral observation and corporate social responsibility assessment. The statistics used in the analysis were percentage, mean, and standard deviation. The results showed that the teaching and learning model by social service has 6 components; namely basic principles, concepts, and theories related to teaching and learning by social service, objectives of the teaching and learning model, teaching procedures social system response principle, and the support system is called "PIPAR MODEL". P-Preparation, -Imagine, P-Presentation, A-Action, And the R-Reflect stage can encourage the creativity of 4th-grade students. To have a creative score of 80 percent, 100 percent, and “PIPAR MODEL” can also develop students to be socially responsible, and socially responsible to a large extent. It has a mean of 4.30 and a standard deviation of 0.612. It has a maximum mean of 4.70 and a standard deviation of 0.460. Second, students have respect for the rights of others. It has a mean of 4.64 and a standard deviation of 0.538. It has a mean of 3.78 and a standard deviation of 0.707.

Keywords: STEAM Education, Service Learning, Responsibility

INTRODUCTION

The global society is changing rapidly with advancement, communication technology has created a phenomenon where there is an enormous amount of information in various sources, as well as having to compete for economic and trade benefits, forcing all countries to accelerate the development of their populations to be of higher quality so that they can live and compete in the labor market with civilized nations. Therefore, the curriculum must be adjusted by integrating science, mathematics, and technology learning. Art and engineering processes so that students can apply them to solve real-life problems and future careers. Teachers and students need to equip themselves with the skills they need to be educators and students for 21st-century education, which is currently a topic of much discussion in academia. Education in the 21 century. It has changed dramatically. Using tools to seek knowledge is more important than knowledge content. Advances in communication technology have allowed students to find

knowledge on their own from many different sources and at any time of their choice. This makes the classroom different from what it is. The image of how students will have a portable computer. Tablets, iPads, or smartphones are therefore common school supplies. Teaching has changed from standing at the front of the class to stimulating and facilitating learning. This allows students to learn and develop their potential as much as possible. With the changing paradigm, the concept of education has also changed. Program for International Student Assessment (PISA).

STEAM concept learning management is a learning management approach for students to know how to think critically and thoroughly. Learning from experience, committing to solving problems, knowing how to work as a team, and working with creativity leads to becoming an innovator. Innovators, educators, or future leaders This is in line with the Basic Education Core Curriculum. The term "STEAM" stands for Science, Engineering, Arts and Mathematics (Kim et al., 2012; Khine & Areepattamannil, 2019; Liao, C. (2016). It prepares students for university admission and prepares them for work. It can be seen that art subjects are important for learning, but most students' art creation lacks basic knowledge and understanding of art design. It was found that most of the students copied the original in the book or on the Internet to organize classroom activities. Teachers lack interaction between students and lack continuity. The media is not diverse. As a result, students lack motivation to study, which causes boredom in studying. Therefore, teachers must find ways to improve and develop the learning process for maximum efficiency, by organizing learning activities that focus on students to encourage creativity. Have the skills to study art. Develop problem-solving skills, cultivate skills in self-education, exchange of ideas, and work experience in the form of processes by basic educational standards (Yakman & Lee, 2012).

Social service learning is a way of organizing learning management activities that motivate students to have hands-on practice in the community. Enrich students and instructors with great learning and experiences. Students develop genuine knowledge and bond with the communities in which they live. Scott (2013) Students are encouraged to choose a community area based on their interest in community service, and can assess the strength of the community based on the problems they have seen by meeting and exchanging lessons with a wide range of individuals who will choose issues to discuss together. Social service learning also helps students make decisions about their needs. Sheh Students have the opportunity to explain. Comment on your own decisions Acknowledge While the activity is in progress. Students have a process of rethinking ideas and information to make decisions. What is gained from social services throughout the project? After selecting the community, the community will conduct a

study from experts and related research until they can establish a basic agreement and plan the activities according to the skills and interests of each person because learning in textbooks cannot create leadership. Learning by social service therefore reflects the belief that education must be truly connected to the needs of society to be as effective as possible. By organizing learning for students to practice and connect their knowledge to their situations and experiences that are consistent with ideas from Freire (1998) to raise awareness or awareness of various problems in society, as well as the concept of Progressivism or Pragmatism, which emphasizes that students learn by doing or gaining practical experience. The definition and definition of learning literacy by social service varies according to each institution to which it is applied, and Schoenfeld (2006) defines learning to know by social service in the same way, as a method of teaching. The goal is to empower students to apply the knowledge and skills they have learned in the classroom to serve society according to the needs of society. Social service learning thus allows students to organize social service activities according to the reneal needs of the locality and also develops students' academic skills and responsibilities. Approaches to developing creativity, we develop an integrated STEAM approach using social service learning. The researcher defined the steps from the research synthesis as follows: 1) P-Preparation, 2) I-Imagine, 3) P-Presentation, 4) A-Action and R-Reflect. It is an integrated learning management approach developed from STEM education. Integration of science, technology, engineering, arts, and mathematics with learning management by social service encourages students to practice in the community and get to know society in real situations. They are critical thinking, committed to solving problems, know how to work as a team, and work with creativity, reflecting on the needs of the society in which the student lives or the nearby community and whom the student can help (Prasertsang, 2016).

From the aforementioned importance comes the above. Therefore, this study aims to develop an integrated STEAM approach using social service learning to address students' creativity. By allowing students to use the knowledge and abilities that they have learned. As a part of Thai society and the world. Additinally, this research aims to create and find the quality of learning styles with integrated STEAM approach using social service learning and to study the creativity of students who have managed to learn according to the learning style with integrated STEAM approach using social service learning.

METHOD

Scope of research

This research aimed to develop a study aims to develop an integrated STEAM approach using social service learning to address students' creativity at the school students under the

Office of the Basic Education Commission in Roi Kaen Sarasin province, Thailand. The researcher has defined the scope of research in 4 areas as follows;

Scope of informants

This research is the development an integrated STEAM approach using social service learning. The subjects used for the experiment were students in grade 4, art learning subjects, and visual arts courses at a School in Roi Et Province, Thailand using the principles of action research.

Data collection

The content used in this research is in the art learning subject group. Visual arts courses, grade 4, according to the subject matter and learning standards of the Basic Education Core Curriculum. 2008 and this school curriculum Semester 2 Academic Year 2023 on Packaging Design Indicators Fri 1.1 M.4-6/5 Create visual art with various technologies with emphasis on design principles and art composition, 6 hours consisting of sub-content, packaging design, community products. Organic rice packaging design, 6 hours.

Building and Finding Tool Quality

We conducted qualitative research and collected data using action research, which defined the research process into three phases, in the following order;

Phase 1 Research: Analyze the documents about concepts, theory, and research related to the integrated STEAM approach using social service learning to develop an integrated STEAM approach using social service learning to address students' creativity .

The sample used to collect data was a school in Roi Et Province, Thailand by selecting a specific model and finding volunteer teachers to co-develop creativity. We used qualitative data analysis.

The research instrument is a form of learning management to develop an integrated STEAM approach using social service learning, visual arts subjects, product design, and checking the appropriateness of learning styles (Srisaad, 2020). If the average score is greater than or equal to 3.50 or more, it is considered appropriate and does not need to be improved. Ensure that the consistency of the assessment items is measured by or to the point of the behavior to be measured or the learning style. If the score is greater than or equal to 0.5 or more, it is considered consistent, no improvement is required. If the score is less than 0.5, the researcher must improve according to the recommendations of experts and a total of 30 items

Phase 2 research builds a model of integrated learning by social service by using the data obtained from the study, analyzing, and synthesizing various principles and theories related to the learning model by social service. Take the findings of Phase 1 draft them into learning

patterns and check the quality of learning styles for students. At this stage, the action research was presented to 5 experts with assessment results ranging from 4.82 to 4.83

Phase 3 research examined the results of using the model by measuring the creativity of students who learned with art activities based on the elements of creativity, namely originality, agile thinking, flexible thinking, and detailed thinking. The IOC assessment results are between 0.6 and 1.00. Student Interview Questions with a consistency index ranging from 0.50 to 1.00 were selected, which were the criteria for consistency between the questions and the issues interviewed. The IOC assessment is 1.00 and the CSR assessment is a tool that the researcher has tried in conducting research on the Development of learning models with social services for students of the teaching profession (Prasertsang, 2016). It is a back-looking data to reflect the learning management results from which students have been managed learning in each operational cycle.

This research is to develop an integrated STEAM approach using social service learning. The researcher presented the findings in response to the objectives of the research. as follows;

Creating and qualifying learning styles of the integrated STEAM approach using social service learning from the study of relevant documents and research. It was found that there are 6 components: principles, concepts, and basic theories related to teaching and learning by social services, objectives of the teaching and learning model Teaching Procedures Social System, the principle of response, and support system is called "PIPAR", P-Preparation, I -Imagine, P-Presentation, A-Action, and R-Reflect as shown in Figure 1.

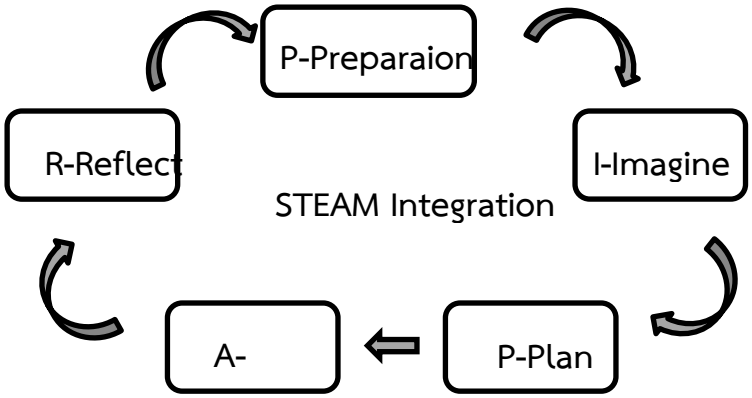

Figure 1. The Cycle of STEAM Integration

RESULTS AND DISCUSSION

PIPAR

Step 1: P-Preparation: The teacher clarifies and informs the objectives of the subject content/ educates students to participate and learn from the activity. How to search for

information from community learning sources/educational wisdom Bring it into the lesson using a problem or situation in a challenging community to determine the scope of the problem. Have students determine the source of learning and local wisdom that the group is interested in.

Step 2: I -Imagine: Students understand the problem. Presenting learning resources and local wisdom together. Find scientific, technological, engineering, and mathematical information or concepts used to solve problems to assess feasibility. Advantages and disadvantages Existing limitations Discuss and find constructive solutions to problems. Design products from local wisdom to be novel and interesting.

Step 3: P-Presentation: Students present the results of gathering information obtained from their research and applying it to plan the design of the piece, taking into account the available resources. Restrictions and conditions according to the specified circumstances and methods appropriate for the creation of the work under the restrictions. The researcher provides guidance and stimulates students to develop a thinking process.

Step 4: Creative Action (A-Action) Students take action in stages according to the work plan. The instructor sponsors the event and provides guidance and mentorship throughout the practice.

Step 5: R-Reflect: Students present their work and jointly think critically and synthesize and evaluate the use of the piece by presenting it in front of the class to improve and develop it to be effective in solving problems optimally. Teachers use questions to lead students to integrate what they get into the STEAM learning process. Further develop the work in the future.

The results examined the quality of the integrated STEAM approach using social service learning. The results of the quality check of learning styles by experts The learning style was found to be appropriate. Most levels It has an overall suitability score of 4.70 and a standard deviation of 0.49.

Study the results of using the study aims to develop an integrated STEAM approach using social service learning that can develop students' creativity and social responsibility. We used action research as shown in Table 1.

Table 1. Results of the analysis of creative scores from the artworks of students who also learned. Art activities of 4th grade students.

Number	**originality (4 ratings)**	**Dexterous thinking (4 ratings)**	**Flexible thinking (4 ratings)**	**Detailed thinking (4 ratings)**	**Overall Score (16 ratings)**	**Percentage**	**Summary of 80% pass**
1	4	4	4	3	15	93.75	Qualifying
2	4	3	3	3	13	81.25	Qualifying
3**	2	2	2	3	9	56.25	Not Qualified
4	4	4	3	3	14	87.5	Qualifying
5	3	3	4	3	13	81.25	Qualifying
6	3	3	3	3	12	75	Qualifying
7**	2	2	3	3	10	62.5	Not Qualified
8**	2	2	3	2	9	56.25	Not Qualified
9	3	3	3	3	12	75	Qualifying
10**	2	3	3	3	11	68.75	Not Qualified
11	4	4	4	4	16	100	Qualifying
12	4	3	3	3	13	81.25	Qualifying
13**	2	2	2	2	8	50	Not Qualified
14	4	4	4	3	15	93.75	Qualifying
15	3	3	4	3	13	81.25	Qualifying
16**	1	1	2	2	6	37.5	Not Qualified
17**	2	2	3	2	9	56.25	Not Qualified
18**	2	3	3	3	11	68.75	Not Qualified
19**	2	2	3	3	10	62.5	Not Qualified
20**	1	1	2	1	5	31.25	Not Qualified
21	3	4	4	3	14	87.5	Qualifying
22	3	3	4	3	13	81.25	Qualifying
23	2	3	4	4	13	81.25	Qualifying
24	3	3	4	4	14	87.5	Qualifying
25	3	4	4	4	15	93.75	Qualifying
26	3	3	4	4	14	87.5	Qualifying
27	2	3	4	4	13	81.25	Qualifying
28	3	3	3	4	13	81.25	Qualifying
29	3	4	4	4	15	93.75	Qualifying
30	3	3	4	4	14	87.5	Qualifying
		$\sum$ x				362	
		$\bar{x}$				12.07	
		S.D.				1.70	
Qualified Students (Persons)						**10**	
Percentage of students who meet the criteria						**33.33**	

*Students whose creativity scores from students' artworks learned with art activities do not meet the criteria of 80 percent

From Table 1, it was found that the scores of 30 students were below the threshold of 80 percent of the students who learned with art activities, which was 33.33 percent of the total

students. The results showed that all 10 students had a creative score of 80 percent or 100 percent.

Through community engagement, students help the community to apply their knowledge to help design products as follows.

Researcher: What do most people in this community do for a living?

Interviewee: "Let's make organic rice."

Researcher: What is different about this community?

Interviewee: "It is a community that has organic rice, produces it and sells it to members within the group."

Researcher: What do you want this community to be?

Interviewee: "I want it to be an organic rice community, with organic rice products known in the market, and add value to organic rice."

In addition, the researcher was interviewed about satisfaction with the community's product design with group members. as follows.

Researcher: "What do you think of the organic rice products designed for you by your students?"

Interviewee: "Organic rice products have a modern design that is suitable for use, I like and am satisfied with the product design that students convey to the organic rice community."

Research on the development of an integrated STEAM approach using social service learning. Two issues were discussed: 1) Creating an integrated STEAM approach using social service learning to address students' creativity and 2) Studying the results of using an integrated STEAM approach using social service learning can promote creativity with students and develop social responsibility. Details of the discussion of the results are as follows;

1) Creating an integrated STEAM approach using social service learning. The integrated STEAM approach using social service learning is called "PIPAR", P-Preparation, 2nd stage, -Imagine stage, 3rd stage, P-Presentation stage, 4th stage, A-Action stage, and 5th stage R-Reflect. In line with the research of Yakman & Lee (2012) and Kim & Chae (2016), teaching and learning are designed according to the 5-step STEAM concept: (1) Ask, (2) Imagine, (3) Plan, (4) Create, (5) Reflect & Redesign.
2) Study of the results of using an integrated STEAM approach using social service learning called the "PIPAR" can encourage creativity of grade 4 students to have a creative score. It was observed from the creative assessment of the artworks of students who learned with art activities that passed the criteria of 80 percent, or 100 percent. According to the objectives

of the research in Operational Cycle 2, when divided into considerations in each operational cycle, the results were as follows: Operational Cycle 1 after the target students organized learning activities based on the STEAM concept in conjunction with social services. It was found that students scored creativity from the artworks of students who learned with art activities. 9 students or 90.00% and 1 student who did not meet the criteria or 10.00%. In the second round, the target students were given a learning activity based on the STEAM concept in conjunction with social services. It was found that 100 percent of students scored 10 percent of their creativity from artworks learned with art activities. And the "PIPAR MODEL" can also develop students to be socially responsible, in line with Kim & Chae (2016) that said that STEAM can support thinking by connecting the knowledge in the lesson to students' real lives by training students to solve multiple problems. Situations in a constructive and integrated way with multiple areas of knowledge. It is also in line with the research of Shatunova et al., (2019) studied the development of creative and innovative skills and attitudes towards learning management based on the concept of STEAM education among high school students. Students have the creative and innovative skills of high school students after receiving higher education according to the STEAM education concept than before. Students can also reflect on ideas by identifying their strengths and weaknesses. The shortcomings of the workpiece, the self-group, and other groups can be principled. There is an exchange of learning through the proposal of ideas. How to improve the work of the self-group It gives students effective thinking. There are criteria and think about what is useful and suitable for use, in line with Henriksen (2017) that STEAM Integration gives students the freedom to create their pieces. Students are trained to develop ideas from integrated learning. Using local learning resources to promote students' creative work with STEAM concept art activities using local learning resources through local material activities. Wicker material crafting is an activity that inspires local inspiration and social responsibility for students (Siddharjan, 2018).

CONCLUSION

We conclude that an integrated STEAM approach using social service learning has 6 components, namely basic principles, concepts, and theories related to teaching and learning by social service, objectives of the teaching and learning model, Teaching Procedures Social System Response principle, and the support system is called "PIPAR". P-Preparation, -Imagine, P-Presentation, A-Action, And the R-Reflect stage can encourage the creativity of 4th-grade students. It has a mean of 3.78 and a standard deviation of 0.707. The instructor must emphasize the learner to observe. Analyze problems so that students can plan solutions in multiple and

complete aspects. Organizing learning activities using STEAM in conjunction with community service should include information materials for students to study, research, and create their creative process to exchange ideas and create an atmosphere in the classroom to exchange and learn from each other.

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