Creative learning model as implementation of curriculum 2013 to achieve 21st century skills

B L Putro*, Waslaluddin, R R J Putra and E F Rahman

Computer Science Education Department, Faculty of Mathematics and Natural Science, Universitas Pendidikan Indonesia, Bandung, Indonesia

*Corresponding author’s e-mail: blputro@gmail.com

Abstract. The 21st century learning model is a way / technique used by teachers to facilitate the best child learning safeguard according to child's condition, child's learning environment, and carrying capacity. The characteristics of learner of the 21st century is important for teachers and parents to know how to facilitate their learning. Mitchel Resnick developed a Creative Learning Cycle method that promises to improve 21st century skills. Creative Learning Cycle method is suitable for elementary school. Creative Learning Cycle consists of 5 stages: Imagine, Create, Play, Share and Reflect. The purpose of this research is to create creative learning model as implementation of curriculum 2013 at elementary school in Bandung to reach 21st century skill. This study uses the correlation method between 21st century learning methods, 2013 curriculum, and 21st century skills. Creative Learning Model as a Learning Implementation of Curriculum 2013 has a positive effect on the achievement of 21st Century Skills students though not all of them have a significant influence.

1. Introduction
The 21st century learning is an effort to facilitate students in the 21st century to experience the best learning experience so that they can achieve learning goals effectively. The meaning of the 21st century is attached to the condition of students in this century. Many important phenomena are related to education in the 21st Century, including: globalization and education, national culture and character, and internet culture and Cyber Society. The 2013 curriculum is a manifestation of a 21st century education paradigm shift in Indonesia. The 2013 curriculum is different from the previous curriculum, but the formal juridical foundation still rests on the Sistem Pendidikan Nasional (SISDIKNAS) Law No. 20 of 2003 [1,2].

The 21st century learning model is a method / technique used by the teacher to facilitate the child's best learning security according to the child's condition, the child's learning environment, and the carrying capacity [3-5]. Characteristics of 21st century learners are important to be known by teachers and parents in order to know how / techniques to facilitate learning [3]. Mitchel Resnick developed a Creative Learning Cycle method that promises to improve 21st century skills [5]. The Creative Learning Cycle method is suitable for Primary Schools. Creative Learning Cycle consists of 5 stages, namely Imagine, Create, Play, Share and Reflect [5]. The purpose of this study was to create a model of creative learning as an implementation of the 2013 curriculum learning at elementary schools in Bandung to achieve 21st century skills.
1.1. The 21st Century Learning
This chapter discusses 21st century skills, and the Creative Learning Cycle method for 21st century learning.

1.2. The 21st century skills
Comparison of the 21st century expertise framework has been done before, namely by Grifin [1] comparing the 21st century skill framework proposed by ATC21s, UNESCO OECD, P21, and European Commission. The following figure shows the results of a comparison between the six skill frameworks [3].

Based on all the opinions and theories that have been stated above, it can be concluded that cognitive abilities are not the only abilities that must be mastered by students, students also need to be equipped with the skills and skills needed to face the challenges of the global community in the 21st century.

Table 1. Skills table 21st century version of ATCs 21[4,6]

| WAY OF THINKING                                      | WAY OF WORKING                                      | LIVING IN THE WORLD                                      |
|-----------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------|
| 1. Creativity and Innovation                        | 1. Communication                                    | 1. Citizenship – global and local                        |
| • Think creatively                                   | • Competency in written and oral language           | • Awareness and understanding of rights and responsibilities as a global citizen |
| • Work creatively with others                       | • Open minded and preparedness to listen            | • Preparedness to participate in community activities    |
| • Implement innovations                             | • Sensitivity to cultural differences when communicating | • Respect the values and privacy of others              |
| 2. Critical Thinking, Problem Solving and Decision Making | • Reason effectively and evaluate evidence          | • Communicate constructively in different social situations |
| • Articulate findings                               | • Solve Problems                                    | • Understand different viewpoints and perfectives       |
| 3. Learning to Learn and Metacognition              | • Self-motivation                                    | • Life and Career                                       |
| • Self-motivation                                    | • Positive appreciation of learning                 | • Adapt to change                                        |
| • Articulate findings                               | • Adaptability and flexibility                      | • Manage goals and time                                  |
| 1. Information Literacy                             | • Use and manage information                        | • Be a self-directed learner                            |
| • Access and evaluate information                    | • Apply technology effectively                      | • Interact effectively with others                       |
| 2. ICT Literacy                                     | • Use ICT accurately, creatively, ethically, and legally | |
To represent 21st century skills by ATCs21 which divides 4 dimensions of 21st century skills, namely: (1) ways of thinking; (2) ways of working; (3) tools for working; (4) living in the world [4,6].

1.3. Creative Learning Cycle
Creative Learning Cycle is a learning approach that is categorized into image activities, create, play, share, reflect and return to imagine activities. This learning can be referred to as Mitchell's Learning Spiral. This learning method is considered appropriate and aligned to be used in 21st century learning (21st century learning) to help students develop creative thinking skills [7]. Like Sawyer [8] reveals that the needs of students in this century are creative thinking, from the process students can help find innovative solutions in all situations that occur in their lives whether the situation is unexpected or not. Initially, this method was used to develop learning methods using a conventional approach to 21st century learning approach methods at the kindergarten level by enhancing creative thinking skills that are the key to professional and personal success [7]. The stages of creative learning that are adapted from learning at the kindergarten level can be explained in Figure 2 below.

![Figure 2. Creative learning cycle [5]](image)

Mitchell Resnick's Learning Spiral is a repetitive learning process designed to strengthen the technique of creative thinking skills in the context of problem solving [5]. The five stages of creative learning are as follows:

1.3.1. Imagine. Imagine is the first step in creative learning cycle learning. Imagine is think about what it is you want to do; brainstorm. Imagine is a process of thinking about what will be done or can be known as a brainstorming process.

1.3.2. Create. Create is the root of creative learning. At this stage students translate ideas generated from the imagine stage into product forms. For example, students develop programming skills by making projects (not just solving puzzles).

1.3.3. Play. Play Stages in learning become different activities at the level of childhood education with other levels of education. Play is a learning stage involving fun experimental processes, trying new things, playing with materials, testing boundaries and taking risks repeatedly. Play is a process to try new creations or products that have been made and see whether the product is running well or not.

1.3.4. Share. Share is a process of showing the creations that have been made to others and seeing what other people think of the creations that are made. Then combine the process into the creative learning process.
1.3.5. Reflect. Reflect is a process of thinking about what has been learned from the creation experience and incorporating new knowledge from the sharing process then back to the image process to create new ideas after going through the process of creative activities. Reflectivity is the most magical and frustrating process because it encourages students to discuss and ask the question "why doesn't this work?", 'How can I change my design?' Reflecting activities can be part of the evaluation of each individual to something that has been made and thought about.

Based on these stages of creative learning cycle learning, the creative learning cycle method is the foundation in making digital technology based on Scratch learning. Along with the development of the concept of creative learning cycle learning, now the concept of learning can be used in learning at various ages. From this explanation, it can be concluded that creative learning is a learning method that can support learning in the 21st century. With social phenomena occurring in the present, this learning method is considered capable of producing thoughts and solutions in solving problems from experiences that have occurred to someone based on their experience.

2. Methods

The research method used is the Concurrent Embedded Mix Method with quantitative methods as the primary method. By using concurrent research methods embedded researchers can collect two kinds of data simultaneously.

The research method by finding the correlation between Creative learning cycle and 21st century skills is illustrated in Figure 3 below. This study maps 3 (three) of the 4 (four) 21st century skills, namely (1) ways of thinking; (2) ways of working; (3) tools for working. The object of the research was carried out in the XI class of Computer Engineering and Networking at SMK 1 Cimahi on Basic Programming subjects. The number of classes available is two classes with a total of 67 students. The sample in this study is the entire population.

The study was conducted by giving treatment to both classes using the Creative Learning method. Creative Learning method consists of Imagine, Create, Experiment, Share, and Reflect stages [9,10]. Student learning outcomes at each stage are collected for research data. In addition, at the end of a learning cycle, students are asked to fill out a student self-assessment sheet containing 21st century skill parameters. Then the learning outcome data and student self-assessment are analyzed to get the results of any learning stages that affect the achievement of 21st century students' skills.

3. Results and Discussion

Testing the correlation model of creative learning with 21st century skills is taken from the learning value of class XI of Computer Engineering and Networking of SMK 1 Cimahi on Basic Programming subjects. The
correlation model of creative learning and 21st century skills is carried out in two analyses: creative learning, and the correlation model of creative learning on 21st century skills.

### 3.1. Creative Learning

The learning outcomes of the creative learning model are illustrated in Figure 4. In the Imagine stage, the project's ideas and planning were assessed, the value of the Create stage was taken from the assessment of the products produced by the students, the value of the Experiment stage was taken from the assessment of the students' independent product test results, the Share stage value is taken from the student's assessment when giving a presentation and class discussion, while the Reflect stage value is taken from the conclusion report input at the Share stage for product improvement or revision.

![Figure 4. Average value of each learning stage](image)

The average value of Imagine students is the value in the middle position, with the top three positions but also the bottom three. Based on the results of interviews and observations made on students, the Imagine stage is the hardest stage they face. This is because students are not accustomed to being given the freedom to choose what products they will make according to the theme. The biggest problem that students must experience is the skill to measure their skills. Many groups of students have high hopes or goals but their skills are still not able to achieve the goals they expect. This requires them to think more critically and more carefully in managing information for reference and planning the project they will do.

The value of Create students is in the highest rank and is included in the very good category while the value of Experiment is in the lowest position even in the good category. This shows that students' skills in creating and making products are very good but their skills in self-reflection are still not as good as the skills to produce their products. Based on observations, the low value of Experiment is because students still feel confused about how to check the program, they made is good or not, besides that students tend to cover up the shortcomings. They are worried that by showing many weaknesses in the program, the value of the program will be reduced so they tend to be deficient by covering up the shortcomings and looking for excuses that the deficiencies have been planned in advance.

The value in the Share stage is the second lowest value after the Reflect stage although it is still in a very good category because it is above 75%. Based on the results of observation, the students' skills in communicating when explaining the products they made or commenting were very good, although in each group there were still one or two students who had difficulty speaking. The biggest communication problem that students have is formal communication skills in the forum and the volume and clarity of speech.

But the student's Reflect value is the best value compared to the others. Based on observations made, students are quite cooperative and able to receive input openly.
3.2. Correlation model of creative learning with 21st skills

Correlation analysis of 21st century Creative Learning and Skills Learning using IBM SPSS AMOS V.22 software. The data processing results are shown in Table 2, and the results of the correlation model are shown in Figure 5.

Creative Learning methods have a positive influence on the achievement of 21st Century skills of students in Basic Programming learning although not all have significant influence. The imagine phase affects Learning and Innovation Skills of 38.1% while the Share stage affects 27.7%. The significance of the influence of the Create stage on Technology, Media and Information Skills is 42.2% while the Experiment stage affects 36.2%. While the Share stage has the most significant influence on Life Skills and a career that is equal to 50.1%.

Table 2. Correlation between creative learning and 21st century skills

| Creative Learning | Correlation | 21st Century Skill | Relationship (R) | Effect (E) |
|-------------------|-------------|--------------------|------------------|------------|
| Imagine           | ==>         | Ways of thinking   | 0.514            | 38.1%      |
| Create            | ==>         | Tool for working   | 0.525            | 42.2%      |
| Create            | ==>         | Ways of working    | 0.232            | 26.7%      |
| Experiment        | ==>         | Tool for working   | 0.393            | 36.2%      |
| Share             | ==>         | Ways of thinking   | 0.295            | 27.7%      |
| Share             | ==>         | Ways of working    | 0.349            | 50.1%      |
| Reflect           | ==>         | Ways of thinking   | 0.633            | 36.6%      |

The model that can describe the influence of each stage of creative learning on 21st century skills in detail is shown in Figure 5 below.

![Figure 5. The influence model of creative learning stages on 21st century skills](image)

All stages of Creative Learning have a positive influence on the achievement of 21st Century skills in Basic Programming students although not all have significant influence. Creative Learning which has the most significant influence on ways of thinking is the Imagine and Reflect stages. While the Creative Learning stage, the most significant effect on tools for working is the Create and Experiment stages. While ways of working are significantly influenced by the Share stage. Imagine stage affects ways of thinking 38.1% while the Share stage affects 27.7%. The significance of the influence of the Create phase on tools for working is 42.2% while the Experiment stage affects 36.2%. While the Share stage has the most significant effect on the way of working that is equal to 50.1%.

4. Conclusion

All stages of Creative Learning have a positive influence on the achievement of 21st Century skills in Basic Programming students although not all have significant influence. Creative Learning which has the most significant influence on Learning and Innovation Skills is the Imagine and Reflect stages. While
the Creative Learning stage, the most significant effect on tools for working is the Create and Experiment stages. While ways of working are significantly influenced by the Share stage. Imagine stage affects ways of thinking by 38.1% while the Share stage affects 27.7%. The significance of the influence of the Create stage on Technology and Media Information Skills is 42.2% while the Experiment stage affects 36.2%. While the Share stage has the most significant influence.

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