

Sharpening 4C for Students in Vocational Higher Education Program Towards Industrial Revolution 4.0 Through Summer Camp

Layta Dinira¹⁾

*Vocational Education Program
Universitas Brawijaya*

Abstract— There are four soft skills of higher education graduates needed to face the Industrial Revolution 4.0 era, namely critical thinking, creative thinking, communication, and collaboration (4C). To compete with other human resources globally and achieve success in the era of Industrial Revolution 4.0, the vocational students also must be equipped with soft skill other than competent scientific skills. However, higher education still focuses on hard skills, not on soft skills; thus, additional activities are needed outside of teaching and learning activities. One way to strengthen 4C is by a summer camp. This article was a literature study that discusses the learning outcomes and strategies of developing critical thinking, creative thinking, communication, and collaboration for vocational students during the summer camp. The learning outcomes obtained by this activity were the ability to evaluate the causal relationship of a problem, the ability to represent new ideas, the ability to exchange information, and the ability to integrate knowledge with other disciplines. Learning strategies that were done to improve the competence of 4C were applying student-centered learning instruction with creative themes and a fun way in the form of presentation, open discussion, and interview in the form of groups consisting of multidisciplinary students.

Keywords: *learning strategy, vocational higher education, industrial revolution 4.0, summer camp*

I. INTRODUCTION

In the fourth generation industry or industrial revolution 4.0, the higher education must prepare the students for Indonesian human resources who have the competencies necessary to face the new era to have global competitiveness. To survive in the era of industrial revolution 4.0, intelligence is not enough for graduates of higher education. There should be other competencies that are added as the learning outcomes of the higher education, namely the 4C formula. The 4C formula consists of critical thinking, creative thinking, communication, and collaboration.

The ability to think critically according to Indonesia Dictionary is the nature of not easy to believe. With this ability, someone will try to analyze the problem deeply to find a further explanation or the errors in the problem. With the help of critical thinking, one will be able to find an effective solution to a problem.

If the university wants the problem-solving competencies of its graduates, then creative thinking is an important competency to develop. Creative thinking is the

ability to generate visual imagery and represent the image into a new idea. Nowadays, the need for a workforce with creative thinking ability increases as a result of a country's desire to become a developed country. Creative thinking also has entered into the fundamental skills of vocational graduate standards in the UK and the United States

Higher education graduates in any study program require communication skills. Many graduates have complete knowledge and competence in their field but cannot convey information related to their expertise to the community well. As

a result, important information that should be known to the public becomes unresolved and misunderstandings occur.

The demand for universities to undertake education containing a multidisciplinary curriculum is growing, which means that every discipline requires good collaboration. The multidisciplinary learning experience helps students to apply and solve real-world problems and help them adapt and empower them toward change. Multidisciplinary education helps students develop critical thinking.

Hence, to implement the 4C formula in higher education as the added value of graduates, especially for vocational education, universities need a learning outcome and strategy. One step that can be done to integrate the learning of critical thinking, creative thinking, communication, and collaboration in one activity is through a scientific camp. In this article, the scientific camp is called the summer camp. Descriptions of achievements and learning strategies of each competency will be discussed further in the discussion section.

II. METHOD

This was a literature study as it was written by collecting, reading, taking notes, and reviewing any conceptual ideas related to achievements and learning strategies of the 4C formula that can be applied to the summer camp. Important ideas from the information were processed and arranged to be analyzed.

III. RESULT

To maximize the learning of the 4C formula, scientific camp activities were implemented for at least three days outside of the regular teaching and learning activities. The

participants of this activity were students of study programs with different disciplines, but still can be integrated with each other. They were given the general topic of every discipline so that each student from different disciplines can still follow the other subjects. The speakers in the camp were practitioners who are experts in applying critical thinking, creative thinking, communication, and collaboration.

On the first day, participants were scheduled to learn about critical thinking skills in the classroom. When studying these competencies, students were expected to develop communication and collaboration skills with other students through the formation of multidisciplinary groups of science and classroom assignments as well as out-of-class tasks that lasted until the second day of the project for community service that will be held on the third day.

Then on the second day, students learned about creative ways of thinking. Just like the day before, while learning the competencies, students were grouped to do classroom and out-of-class tasks in the form of projects for the third day. On the third day, students applied their competence in the form of community service from the project that was given. The expected learning outcomes and learning strategy of each 4C formula competence during the summer camp was elaborated further in the following description.

A. Critical thinking skill

The ability to think critically is a new technology of cognitive education to develop the competence of logical thinking. Currently, critical thinking learning has been taught as an academic discipline by universities in the United States, Britain, Canada, and other countries. The critical thinking skills required by students that can be realized as a learning achievement of critical thinking skills are: (1) recognizing, understanding, and evaluating the causal relationship of a problem; (2) having a desire to question majority opinion; (3) understanding the way of thinking of oneself; (4) applying deductive hypotheses to reasoning; and (5) analyzing, evaluating, and correcting mistakes.

To facilitate the learning achievements in the summer camp, supportive and innovative training were required. Supportive training aimed to evoke previous social experience while innovative training sought to stimulate the thought processes that exist in the environment. The learning strategy of critical thinking skill based on supportive and innovative training was making learning instruction with student-centered learning method which focuses on deep analysis and evaluation about problem and justification of evidence from available information.

In the beginning of the class, the lecturer or instructor should ask a question. It should not be a question answered with a 'yes' or 'no', but a question that can invoke the curiosity, brainstorming, and open discussion with students. It should be noted that the question must be a specific problem. To be able to answer that question, students should be given the information they need by providing them with reading material. They

also need to be placed in peer groups so that they can solve the problem together.

B. Creative thinking skill

Many organizations need creative energy as the main asset to face the future economy. The university has been known to be a producer of innovation and creativity. The ability to think creatively is characterized by being able to visualize and represent new ideas.

To improve student creativity, the university should create a supportive atmosphere such as good laboratory facilities. Every academic community in the environment should support creativity. Methods that can be done to support the improvement of creativity are: (1) developing student motivation in a fun way; (2) developing positive and advanced thinking of the students; and (3) giving freedom when performing tasks with creative themes.

In the class, to teach creative thinking can be started by ask the students to think or do something different from their habit. The students should challenge themselves to think or do something new and out of the ordinary. The lecturer or instructor could ask the students to explore new inspiration sources together. At the end of the class, students can deliver their idea using visualized mind map.

C. Communication skill

Communication is the process of exchanging information in a verbal and non-verbal way, such as written and social interaction. Verbal and non-verbal communication can be nurtured with activities such as presentations, open discussions, and interviews. Communication skills can be seen from the clarity of conveying ideas, the flow of arguments, the use of simple and easy to understand sentences, and the way of scientific writing. In addition, communication skills are also evident from negotiation, language, culture, and modesty.

Learning strategies that can be done are one-to-one mentoring, community learning making, and developing an online module for students.

D. Collaboration skill

Collaboration at the level of higher education means multidisciplinary. Multidiscipline is two or more integrated disciplines. Integrated means that the disciplines intersect and support each other and provide information to each other. The collaborative enhancement strategy that can be done is to create a collaborative environment with other study programs and the formation of multidisciplinary groups.

IV. CONCLUSIONS AND RECOMMENDATION

Strengthening the competence of critical thinking, creative thinking, communication, and collaboration in an integrated way can be done outside the teaching and learning activities, namely through summer camp activities. The ability to think critically during the summer camp that was obtained by the students was the ability to recognize, understand, and evaluate the causal relationship

of a problem. The ability of creative thinking developed in the camp was the ability to visualize and represent new ideas. Meanwhile, the communication skill trained in the camp was the ability to exchange information verbally and non-verbally. The collaboration skill obtained by the students was the ability to integrate their knowledge with other disciplines to be beneficial to society. Learning strategies that were done to improve the competence of 4C during summer camp were applying student-centered learning instruction for general topic with creative themes and a fun way in the form of presentation, open discussion, and interview in the form of groups consisting of multidisciplinary students.

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