Green skills in vocational learning through the project citizen model

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Abstract. The problem in this research is effort to increase green skills implementation in vocational school. The purpose of research is how green skills implementation through the project citizen model. The method used is Classroom Action Research (CAR). The subjects of the study were students of SMK Muhammadiyah Palangka Raya and SMKN 1 Palangka Raya in class XI. The results of this study indicate that the planning carried out in this study is to sort waste according to the type of waste. Another thing when implementing is the need for deeper explanation to students in identifying green skills problems, explaining solutions in applying green skills, and efforts to apply green skills to students when practicing in a laboratory or workshop. In this study an increase in green skills in the aspects of the ability to sort waste, the ability to analyze costs, and the ability to process products that will be made with used waste. This can be seen from the results that have been described where from each cycle from cycle I to cycle III increased in aspects of waste management with a score of 82 (good), the ability to make products from used mate-rials with a score of 3.7 (very good) and the ability to analyze the production costs of the product to be made with a score of 3.70 (very good) related to green skills in students practicum in vocational education.

1. Introduction

Science that is closely related to vocational sciences, of course integrated with the skills, abilities, and dexterity that are components in human life. Individuals are prepared to be able to use reason, thoughts, ideas and creativity in doing, changing and doing something more meaningful so as to produce a value from the results of the work. This is in line with the objectives of vocational learning according to Law No. 20 of 2003 specifically: (a) preparing students to become productive people, able to work independently, to fill the existing work as intermediate level workers in accordance with competencies in the expertise program that is chosen, (b) prepare students to be able to choose a career, be tenacious and persistent in competence, adapt in the work environment and develop professional attitudes in the area of expertise they are interested in, (c) equip students with science, technology and art to be able to develop themselves in the future both independently and through higher education, and (d) equip students with competencies that are in accordance with the chosen expertise program [11].

Vocational education which is known among educational institutions with Vocational High Schools is education at the level of secondary education which prioritizes the development of students' abilities in carrying out certain types of work. With these characteristics, it means that Vocational High Schools have differences with senior high schools in general. Vocational High Schools (SMK) in the teaching and learning process have additional subjects that are productive subjects or lab workshops and laboratories. To support workshop practicum activities, schools need to have adequate facilities such as
practice rooms that are in accordance with the areas of expertise competency, tools and practicum materials, and other supporting facilities.

Completeness of practicum facilities owned by schools when viewed from several standards set by the government have been met as stated in Government Regulation Number 19 of 2005 about Standards for facilities and infrastructure article 42 paragraph 2 stated that: Each education unit must have infrastructure that includes land, classrooms, leadership room for education units, teaching room, administration room, library room, laboratory management room, workshop space, production unit room, canteen room, power and service installation, sports center, place of worship, playground, and space needed. to support an organized and continuous learning process.

Judging from the teaching and learning activities carried out in vocational high schools (SMK), in addition to normative and adaptive learning productive learning is also carried out namely learning that is related to direct activities in the field such as practical work or concrete actions that produce a work that is useful and useful. Each product produced must have a residual waste or unused raw material. The lack of management capacity related to the utilization of used waste from production results is what needs to be instilled in students so that students are more concerned about the environment, have a creative attitude, and increase awareness of the environment around students.

Efforts to foster students’ concern for the environment are considered important in an increasingly complex era of environmental sustainability at this time, educational institutions should begin to pay more attention in the formation of environmental management skills for educators and students well, known as Green Skills. Green skills are one of the 21st century skills needed to customize products, services and processes to be environmentally friendly. Development of green skills needs to be done through education as one of life skills / transferable skills. This is to support an efficient and sustainable society. At the end of 2009, the Department for Business, Innovation and Skills (BIS) published the Sustainable Development Action Plan, a policy plan that includes various initiatives to respond to environmental change with the aim of sustainable development (Education for Sustainable Development or ESD). In 2011 the British government issued the Skills for Green Economy, a skills development report related to recommendations from Skills for Sustainable Growth.

Indonesia is one of the countries that signed several agreements related to climate change issues including the United Nations Framework Convention on Climate Change and the Kyoto Agreement. Indonesia has adopted a number of policies on renewing energy, carbon impacts, and environmental technology related to the development of industry and education. ESD practices should be applied at all levels and contexts of learning. Nevertheless UNESCO noted that the development of ESD was still on a small scale in the form of projects within a certain period of time. According to UNESCO’s findings, there is no coherent policy and view and a clear vision of the role of ESD in learning and its contribution in improving the quality of graduates, including in vocational education. In developing countries there are still few policies regarding education for sustainable development. In Indonesia, the need for educational policies in supporting education for sustainable development programs as a key to sustainable society or social balance of life.

In connection with the above, Indonesia has a province that is one of the centers of world attention, namely the Province of Central Kalimantan. In Central Kalimantan there are many green areas and national parks and which have greatly helped the world in carrying out the Education for Sustainable Development mission. It would be interesting if this was supported by educational institutions so that they could impart skilled attitudes towards the environment (green skills) since they were in school. Schools that equip students with skills include vocational high school (VHS).

From the results of observations in several schools in the city of Palangka Raya, Central Kalimantan Province it is known that not many schools pay attention and try to practice aspects of green skills in their respective schools, especially vocational high schools (VHS). But not all schools have not implemented green skills, there are some schools that have implemented green skills but only limited knowledge and have not applied it well, so that there is maximum implementation, one of the solutions is there must be efforts to increase green skills into aspects of routine learning activities.
Green skills can be integrated into practicum learning in vocational schools through making tools to utilize waste products that are not used, train students to process used products to be valuable and valuable, train students to have good innovation on the ability to manage the remaining raw materials, train STEAM or the ability students in calculating, utilizing existing technology and looking for techniques or ways that a used item can be processed and useful again, and finally practice the ability to analyze the impact of a business or industry where students work later so that the ideas obtained are not harmful and can be useful for the people around him. This program not only helps protect the environment but also develops entrepreneurial skills, innovative skills, and critical thinking skills.

Efforts to implement Green Skills in schools are expected to show positive results on health, cognitive development, attitudes and behavior. Another positive impact is that this program encourages school freedom to determine programs according to the national curriculum and refers to 21st century skills.

1.1. Literature Review
1.1.1. Vocational Education
Vocational education is a form of education that is the focus in Indonesia today based on Presidential Instruction No. 09 of 2016. Putu said that vocational education is education for vocation or education for occupations [13]. Vocational education for the world of work in question is that through vocational education a person is trained to have the capacity and capability to carry out a task or position. Owned capacity is obtained through productive training so as to produce special skills according to the business world and the industrial world.

This opinion was confirmed by Byram & Wenrich (1956: 50) that "vocational education is teaching people how to work effectively" [2]. Vocational education does not only produce graduates who can work alone, but can work effectively. Work effectively ie work can achieve the goals of the workforce using skills. The word teaching in this definition illustrates that these skills are obtained through the educational process to students. So that vocational education forms graduates who have skills through education that contains the learning process of how to work effectively at the business world and the industrial world.

Another opinion is that vocational education is an educational program that prepares individual students to become a professional workforce [4]. Vocational High School as a provider of vocational education programs in the educational process puts forward the acquisition of skills that are appropriate to the objectives of the education program. The skills taught are skills that have been arranged in such a way by the central government as a reference for each SMK. The determination of these skills refers to skills relevant to the business world and the industrial world, so these skills are useful as provisions for vocational graduates to obtain and maintain professional jobs. Based on the above opinion, it can be said that vocational education is education that aims to provide skills to someone to be able to work professionally in certain fields.

Vocational High School (VHS) is one of the vocational education institutions in Indonesia. Vocational schools aim to print profiles of graduates who are ready to work compete nationally, regionally, and globally. In the Education System Law (Law Number 20 Year 2003 concerning the National Education System) it is stated that vocational education is secondary education which prepares students especially to work in certain fields [11]. VHS is one embodiment of vocational education. In addition, vocational education also has its own characteristics from other general education.

1.1.2. Green Skills
Green Skills, there are many that mention green technology, green industry, green environment, green skills and all things related to the word green. But the meaning of Green Skills is an element that is described as a natural event such as tree and forest management, life, stability, and natural. Until now there is no accurate definition of Green Skills / Green Skills. But to illustrate the concept of green skills from the perspective of researchers in this experiment Green Skills is a skill concept that emphasizes
environmental elements in life and how individuals living at that time can ensure sustainable development through the economy, society and country.

Green Skills are aspects of vocational or vocational skills, or also generic skills which include sustainability approaches, problem solving, innovation (Green Approach, problem solving, innovation) and these Green Skills are needed in all industrial sectors in response to climate change and must be sustainable. Green Skills also means "green work skills", that is, individuals who contribute to the environment and increase environmental sustainability are better, the Council of Australian Governments (2008) [3].

Douglas E. Gordon, Hon. AIA (2010: 1) mentions "a school building or facility that creates a healthy environment that is conducive to learning while saving energy, resources, and money [5]. The concept of "Green" in question can be interpreted as sustainable (sustainable), earthfriendly (environmentally friendly), and high performance building (buildings with very good performance). Green Skills has a direction in training students to commit and systematically develop environmental programs to apply to all activities in the school.

Murray (2005: 5) states that green skills can be said to be an activity 1) Developing confidence in demonstrating time and space for independent learning, 2) Developing social skills / social skills and awareness in teamwork increases and students are more active in participate in mutual cooperation, 3) Develop physical and motor skills, 4) Increase knowledge and understanding of the environment and be responsible for the environment, 5) Provide new perspectives on how teachers teach, manage practical activities, and how to manage learning outcomes with well [9].

Green Skills are skills towards a sustainable environment that are preserved and developed from technical aspects, values and attitudes. All of these skills are needed by the workforce to develop and support social activities, economic, industrial and community outcomes [10]. Pavlova also mentioned several Green Skills elements including [10]:

1. Environmental Awareness or environmental awareness, attitudes and readiness to learn about sustainable development and pay attention to current environmental management problems and challenges.
2. Coordination and Management or holistic coordination and management, coordinating skills and leading to find solutions for ecological goals.
3. Entrepreneurship Skills Entrepreneurial skills, students have the ability to sell recycled products processed waste materials.
4. Innovation Skills Innovation skills, students are required to identify opportunities and create new strategies to respond to the challenges of greening.
5. STEAM Skills or STEM skills: science, technology, engineering and mathematics contribute to the process of forming environmental management skills.
6. Analytical thinking skills: As a step towards sustainable skills, there will be demands to find ideas amid a rapidly growing industrial waste situation.

Law Number 32 of 2009 concerning Environmental Protection and Management in article 65 point four states that "everyone has the right and role in environmental management". Schools as educational institutions have the obligation to play a role in efforts to manage the environment through existing subjects in the world of education, especially vocational education [15].

1.1.3. Project Citizen
This learning model is a learning treatment that was first used in 1992 in California, United States. Then this program was developed by the Center for Civic Education (CCE) in 1995 [1]. Project Citizen was developed from a critical approach model pioneered by John Dewey with the paradigm of how a person think. Project Citizen is problem-based learning to develop the knowledge, skills and character of democratic citizens that enables and encourages participation in government and civil society. Project Citizen learning approaches are oriented towards critical, creative, and problem solving thinking processes [1]. The Project Citizen learning model is also known as a portfolio based civic education
2. Research Methodology

The subjects in this study were students of class XI of SMK Muhammadiyah Palangka Raya and SMK 1 Palangka Raya and accompanied by class teachers. The object of research in this study were all students of class XI of SMK Muhammadiyah Palangka Raya and SMKN 1 Palangka Raya. The reason for choosing grade 11 is because grade 11 students have done practicum for 1 semester and still have 3 semesters left in applying aspects of green skills. The length of the research period is from June 2020 to August 2020. The stages of research represented Figure 1.

![Figure 1. Stages of Research](image)

The method used in this study is the Classroom Action Research (CAR) method. Mulyasa, (2009: 10), argues, that Classroom Action Research (CAR) can be interpreted as research conducted with the aim of improving the quality of the process and learning outcomes of a group of students [8]. Jhon Elliott (2011: 10), tries to describe in more detail step by step that researchers must do [6]. The basic idea starts...
from the discovery of the problem and then designs certain actions that are considered capable of solving the problem, then is implemented, monitored, and then the next action is taken. The following is a chart of the John Elliott model’s [6]. Figure 2 shows research steps.

3. Results and Discussion

Results Observation for the improvement of green skills aspects of sorting waste waste according to the material is started from looking for individual evaluation values. Individual evaluation values are the output of the components of knowledge that need to be investigated. The component or domain of knowledge is the focus of research in the first cycle. This evaluation value supports the formation and improvement of the awareness component and also the application of green skills. The recapitulation of the observations of the components of knowledge of students of SMK Muhammadiyah Palangkaraya and SMKN 1 Palangkaraya is presented in the graph below.

![Figure 2. Research Steps](image)

![Figure 3. Analysis Results for Students](image)

From figure 3, Recapitulation of student observation analysis results for students. Based on the achievement of the average value obtained by students in cycle 3 with an average of 82, it can be
concluded that the aspects of students' knowledge of green skills especially the problem of sorting waste according to the material has been achieved well. The ability to sort is part of one component of green skills, namely the ability to take decisions, the decision to sort waste according to its type. This is in accordance with the statement of Septiyan (2017), stating that decision making skills are skills that need to be taught and trained to students or students starting early in daily life [12]. The same thing was stated by Walker Krehbiel (2012), stating that the decision making process is a tool that can help you members reach goals and help you be more satisfied with the quality of your life [7].

Results Observation of the improvement of green skills aspects of utilizing used waste into creative products was carried out in the observation sheet of the skills component. The following presents the results of the recapitulation skills of all meetings in the table below.

![Diagram](image-url)

**Figure 4. Skill Component Data Collection**

From figure 4, recapitulation of skill component data collection. The achievement of indicators of students in the aspect of skills reached 3.7 with the criteria of "good", so that the third cycle in the component of utilizing used waste into creative products has been well achieved. This is in accordance with Yunansah's statement that green skills are not built through an educational process that is only a transfer of knowledge, but a learning process that places students as active subjects in learning [16].

Results Observation of the improvement of green skills aspects making details of the costs of producing a product from used materials is carried out in the observation sheet analysis component. Following is the presentation of the results of the recapitulation of awareness of all meetings in the graph below.
Figure 5. Component Recapitulation

Figure 5. In cycle 3 the analysis aspects reached an average value of 3.71. This shows that the aspects of green skills analysis are at a very good stage, and have reached the expected value. This is in line with the opinion of Swaak & Van Joolingen students' analytical skills can also be improved by applying the discovery learning model [14]. Project citizen learning model can improve the ability to think at a higher level (analyze, synthesize and create).

4. Conclusion

Based on the results that have been described, it can be concluded that: The planning of learning using the project citizen model must really be arranged properly. This affects the implementation time, because the time required is not short. Planning conducted in this study is to sort waste according to the type of waste. The study an increase in green skills in aspects of the ability to sort waste, the ability to analyze costs, and the ability to process products that will be made with used waste. This can be seen from the results that have been described where from each cycle from cycle I to cycle III has increased in aspects of waste management with a score of 82 (good), the ability to make products from used materials with a score of 3.7 (very good) and the ability to analyze the production costs of the product to be made with a score of 3.70 (very good) related to green skills in students' practicum.

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