Implementation of Green Skills in Vocational Education: Perceptions about Students' and Teachers' Behavioral Activities

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Abstrak

Pendidikan kejuruan memiliki tugas untuk membantu industri hijau dan pembangunan berkelanjutan di masyarakat. Namun pembelajaran pada pendidikan kejuruan masih memiliki banyak kekurangan yang harus diatasi mengingat kontribusi dampak negatif yang cukup besar terhadap lingkungan. Penerapan keterampilan hijau dalam pembelajaran sangat penting sebagai upaya mengatasi permasalahan tersebut. Penelitian ini menganalisis persepsi guru dan siswa sebagai praktisi pembelajaran terhadap implementasi green skills berupa perilaku aktivitas dalam pembelajaran. Sepuluh guru dan delapan siswa dilibatkan sebagai informan kunci dalam pengumpulan data melalui teknik wawancara semi terstruktur. Data kualitatif dianalisis secara tematik dengan bantuan Software NVivo 12 Plus. Temuan dalam penelitian ini diklasifikasikan ke dalam tiga aspek utama, yaitu kegiatan perencanaan keterampilan hijau, kegiatan perilaku hijau selama pembelajaran, dan evaluasi implementasi keterampilan hijau. Merencanakan kegiatan terkait perumusan luaran kompetensi hijau, kebutuhan infrastruktur dan kesiapan siswa. Sepanjang implementasinya berorientasi pada perilaku reuse, reduce, repair dan recycle. Dampak perilaku hijau yang dihasilkan adalah tentang kenyamanan belajar siswa, perilaku hemat energi dan kemampuan mengembangkan produk hijau. Evaluasi yang dirasakan terkait dengan peningkatan metodologi pembelajaran dan membangun kolaborasi di kelas atau kolaborasi dengan pemangku kepentingan, termasuk industri hijau, dinas lingkungan hijau setempat. Selain itu, penguatan kompetensi manajemen pembelajaran berbasis keterampilan hijau sangat penting untuk dilakukan.

Kata Kunci: Keterampilan Hijau, Aktivitas Perilaku Hijau, Pendidikan Kejuruan, Persepsi Guru, Persepsi Siswa

Abstract

Vocational education has a duty to help green industries and sustainable development in society. However, learning in vocational education still has many shortcomings that must be overcome, given the contribution of a sizable negative impact on the environment. The implementation of green skills in learning is very important as an effort to overcome these problems. This study analyzes the perceptions of teachers and students as learning practitioners towards the implementation of green skills in the form of activity behavior in learning. Ten teachers and eight students were involved as key informants in collecting data through semi-structured interview techniques. Qualitative data were analyzed thematically with the help of NVivo 12 Plus Software. The findings in this study are classified into three main aspects, namely green skills planning activities, green behavior activities during learning, and green skills implementation evaluation. Planning activities related to the formulation of green competency outcomes, infrastructure needs and student readiness. As long as its implementation is oriented towards the behavior of reuse, reduce, repair and recycle. The impact of green behavior that is generated is about student learning comfort, energy-saving behavior and the ability to develop green products. The perceived evaluation is related to improving learning methodologies and building collaboration in class or collaboration with stakeholders, including the green industry, the local green environment service. Besides that, strengthening the competence of green skills-based learning management is very important to do.

Keywords: Green Skills, Green Behavioural Activities, Vocational Education, Teacher Perceptions, Student Perceptions

1. INTRODUCTION

There are expectations that technological developments, especially in the 21st century, will bring changes for the better in life. The main indicator is to provide efficiency

and effectiveness in all areas of work for humans. In addition, comfort and convenience in carrying out activities is also a priority for technology development (Baharun & Finori, 2019; Xu et al., 2018). In this regard, it is not surprising that industries have transformed, both in terms of quantity and technology adoption (Fan et al., 2018; Li & Yuan, 2021; Mumtaz et al., 2016). However, this is precisely what has the potential to cause a very dangerous impact on human life (Kahia & Ben Jebli, 2021; Khan et al., 2021).

Behind the efficiency, effectiveness, and ease of doing work, it turns out that the level of damage to the environment is slowly increasing (Kahia & Ben Jebli, 2021; Liu et al., 2021). How could it not be, considering that industrial growth as a result of developments in science and technology is not matched by awareness in humans (Korhonen & Lappalainen, 2004; Liu et al., 2021). Previous study reveals 69% of the decline in the quality of ecosystems on earth. Although, the results of comparative studies in various countries, environmental degradation tends to occur in developing countries (Demir et al., 2021; Fan et al., 2018; Fu et al., 2020; Geng & He, 2021). Of course this problem is important for humans to solve, bearing in mind that the leading theory of anthropocentrism emphasizes that humans are the most decisive creatures in the ecosystem order (Gough et al., 2020; Mao et al., 2019; Yafi et al., 2021). Thus, it is very important to build awareness and skills in humans in maintaining ecosystem sustainability.

In order to increase awareness and skills based on ecosystem sustainability, the concept of ESD has been promoted since the last decade (Demir et al., 2021; Pavlova, 2009). ESD has actually been introduced a long time ago, ie. Previous study mentioned since the early 1980s that the concept has become an international discourse (Gough et al., 2020). The orientation is to train human sensitivity to the sustainability of the ecosystem that adjoins it. ESD carries the main mission of greening education as a path of sustainable development through the provision of green skills to students. Although there is no clear history of implementation in an educational institution, however other study emphasized that ESD must be attached to vocational education institutions (Pavlova, 2009).

This means that it is very important that vocational education plays an important role in sustainable development by acquiring and implementing green concepts in its learning (Billett, 2011; Jaeger, 2014). This is not without reason, considering the essence of vocational education which equips work competencies according to industry needs. Meanwhile, industry is known as one of the biggest contributors to waste and damage to ecosystems. Therefore, there is no choice but to teach carefully related to green awareness and skills through greening vocational education for sustainable development (Kaliappan & Hamid, 2021; Olajire, 2020).

Through research in various countries that have been carried out, previous study emphasizes two important aspects of greening skills in vocational education students, including greening learning activities and the classroom environment (Cabral & Lochan Dhar, 2019; Gough et al., 2020; Pavlova, 2009). These aspects are packaged into green behavior activities in vocational education which are integrated into both theoretical and practical learning. There are six behavioural activities that are important and are the main indicators of green behavior activities, namely rethink, refuse, repair, reduce, reuse, and recycle (6R). The six main indicators must be attached to the vocational skills being taught. Rethink is interpreted as rethinking work processes that involve tools, energy and materials that have a negative impact on ecosystems, so as to produce concepts or ideas that are able to minimize or even eliminate these negative impacts (Cabral & Lochan Dhar, 2019; Gough et al., 2020; McCoy et al., 2012).

Refuse is defined as the behavior of rejecting or avoiding the use of work materials and tools that have a negative impact on the ecosystem and lack better efficiency and effectiveness. Repair is defined as innovative behavior in repairing work materials or tools

that have the potential to become waste contributing to ecosystem damage, usually related to materials or tools that cannot be decomposed by the soil. Reduce has the meaning as the behavior of reducing as much as possible the use of materials or energy that can only be used in a limited way. Reuse is defined as innovative behavior in reusing work materials that have the potential to damage ecosystems but can be reused for other aspects of work. Recycle is also defined as an innovative behavior of recycling damaged materials and limited energies.

Not only the students, but the six behaviors that are packaged in green skills must also be reflected by the teacher as the manager of learning in the school environment. However, the example of a teacher is very meaningful in influencing the successful implementation of green skills in students in vocational education (Pavlova, 2009; Sern et al., 2021). Several researchers have observed green behaviors throughout vocational education and training and confirmed that the lack of green skills in students is a reflection of teacher or instructor behavior that does not apply them properly (Cledumas et al., 2020; Hamza et al., 2020; Napathorn, 2021; van den Bogerd et al., 2020). This indicates that the transformation of green vocational education must be comprehensive, especially for teachers and students who have become one package. Thus, this underlies us in conducting research to analyze the implementation of green skills in learning activities in vocational education. By collecting several pilot green schools and schools that have not yet planned a green program, we aim to uncover students' behavior in implementing green skills which include planning, activity and evaluation.

2. METHODS

This research adopted a case study research method with a qualitative approach. This method was chosen because it can measure the level of application, and find and understand cases that occur based on the experiences of related practitioners in depth to produce comprehensive data (Cresswell, 2009). First, this research conducted a survey measuring the green behavior of students and teachers and followed by semi-structured interviews.

The participants in this study were 42 teachers and 73 vocational education students in Indonesia, particularly in the Five Major Provinces, namely Bali, East Java, Central Java, Yogyakarta and West Java. The participants involved cover the fields of technology and engineering expertise, information and communication technology, and tourism. Participants were selected specifically those who had applied green skills for more than one year. The purposive sampling technique was adopted by distributing questionnaires online using Google Form assistance to representatives of research partners who have access to vocational education in the five provinces. While the demographic characteristics of students include gender and class level. Demographic data from both are presented in Table 1.

Table 1. Participant Demographics

Dimensions	Category	Public School F (%)	Private School F (%)
Teacher			
Gender	Male	12 (28.57)	6 (14.29)
	Female	16 (38.10)	8 (19.05)
Teaching experience	1-5 years	4 (9.52)	7 (16.67)
	6-10 years	4 (9.52)	5 (11.90)
	11-15 years	5 (11.90)	5 (11.90)
	>15years	9 (21.43)	3 (7.14)
Level of education	Bachelor's	10 (23.81)	17 (40.48)
	Master's	5 (11.90)	8 (19.05)

Dimensions	Category	Public School F (%)	Private School F (%)
	Others	2 (4.76)	0 (0)
Student			
Gender	Male	17 (40.48)	18 (42.86)
	Female	24 (57.14)	14 (33.33)
Grade	Class 1	8 (10.96)	11 (15.07)
	Class 2	11 (15.07)	13 (17.81)
	Class 3	16 (21.92)	14 (19.18)

This study adopted two stages in data collection with ongoing needs. First is survey of vocational education teachers and students in five provinces in Indonesia who are involved in implementing green skills in daily activities in the school environment. After the survey data was collected, it was then transcribed and pre-coded. The researcher created an interview guide based on the initial code from the first stage data. The purpose of the interview is to get more meaningful data. Interviews were conducted directly for 1.5 - 2 hours per respondent after the lesson was over. All informants, both teachers and students, were assured of confidentiality and given pseudonyms to get the level of accuracy of the data.

This study adopted an inductive and thematic analysis that was used to identify, evaluate, and create themes expressed by participants based on their experiences. The responses of each participant, especially in the first stage, were coded using keywords so that they did not overlap. The NVivo 12 program is used to assist the coding and categorization of data by researchers. Data from surveys and interviews are entered into Nodes and Cases to be grouped into data with a certain code. The thematic maps show the organization of concepts according to various levels, and the potential interactions between concepts are then developed. The analysis team then discussed all the codes and categorization, as well as possible integrations between the codes so that the code could be simplified. This inductive technique allows identification of themes that participants provide in response to research questions. Figure 1 describes the conceptual framework that explains the results of the research scope.
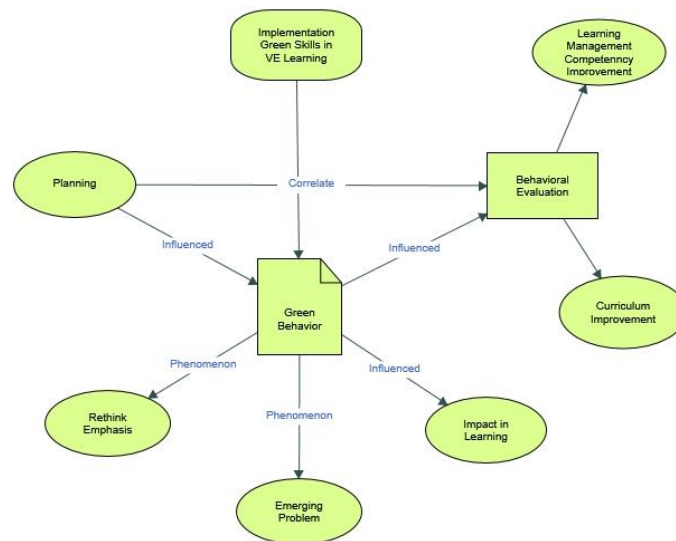

Figure 1. Concept MAP on the Research (with NVivo 12).

3. RESULTS AND DISCUSSION

Result

Green Skills Planning

A green skill planning is an important activity that is carried out before the implementation of related learning to achieve green skills that are reflected in student behavior during learning. In planning activities, we found three major aspects carried out especially by schools and subject teachers. Some teachers say that planning is an important key in building important green behaviors during learning. The first planning aspect is related to the formulation of green competency outcomes, where this competency includes making green products, solving green problems, and implementing energy savings. Furthermore, the second aspect is strengthening students' readiness to apply green skills through their behavior in learning. This refers to strengthening awareness of green environmental sustainability and strengthening student motivation to green jobs. The last aspect of planning that emerges from teacher experience is related to the readiness of infrastructure before learning. Where this aspect includes infrastructure with basic ingredients for a good life, has the ability to facilitate social relations, and is able to provide occupational safety and health. Opinions regarding the formulation of green competence results from several teachers who apply green skills-based learning are detailed in Table 2.

Table 2. Opinion on the Formulation of Green Competency Results

Statement	Participant
Talking about green skills-based learning planning, the most important aspect that I have done is to formulate the competency outcomes. Achieve competence related to making green products is a priority that I set. This is very important, because by making green products, it is hoped that they can be applied in the school, work or community environment to help overcome environmental problems	Teacher 2, 3 and 5
In planning, I analyze competency outcomes that are in line with the implementation of green skills. What I have formulated is related to solving green problems which is an important competency for students to achieve. Students will be directed to analyze problems related to the environment according to the context and field studied, then they will be directed to formulate solutions to overcome them	Teacher 6 and 7
The main focus in formulating competency outcomes is energy saving, which is very important for human sustainability and maintaining non-renewable energy. The achievement of this competence provides opportunities for students to use technology that provides better work efficiency. In addition, students are also directed to be able to develop learning innovations to save energy through the materials and equipment used	Teacher 8 and 10

In terms of planning on competency outcomes, making green products is the main achievement that students must have through learning. Through making products, students are given the opportunity to analyze the potentials that are the focus of making products to deal with problems in the environment. Furthermore, several teachers revealed that the important key as competency achievement was related to green problem solving abilities. This relates to the process of analyzing the causes of environmental disturbances within the

scope of the context of the field being studied. Then students are directed to collect various learning resources for problem solving materials. Finally, the competency achievement that is also important is related to the ability to save energy. Green skills planning activities is show in Figure 2.
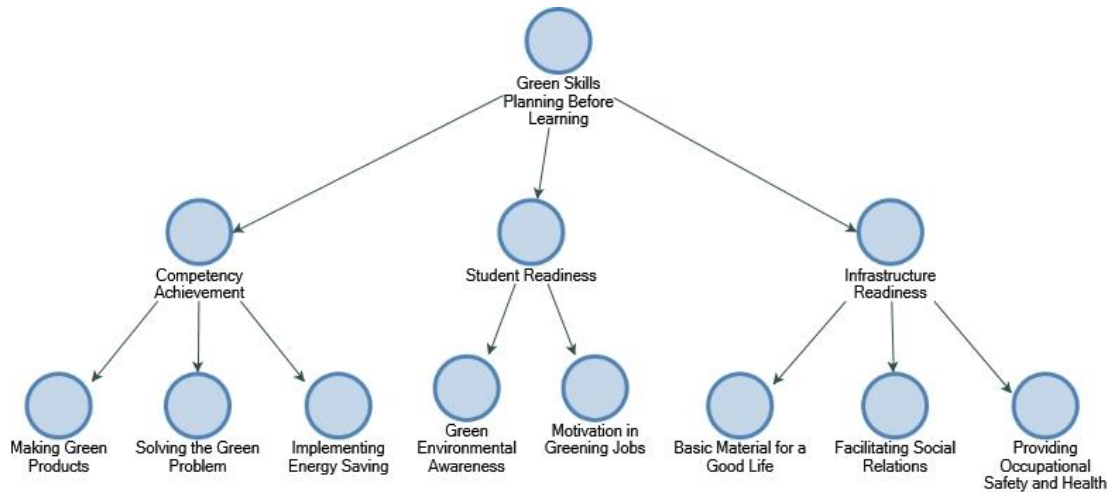

Figure 2. Green Skills Planning

Shifting to student readiness, the important subject matter is related to strengthening students' awareness of the environment and strengthening their motivation to make their jobs green. Two teachers stated that students' awareness of the environment was the key to building student stimulus in maintaining environmental class through learning efforts. Awareness is a fundamental aspect that spurs students to open green literacy and develop green skills. Meanwhile, motivation is also seen as a fundamental aspect that must be strengthened before implementing green skills in learning. According to one teacher, this is important to encourage students to have high determination in applying green skills to their future jobs. Some of the teacher's opinions collected regarding student readiness are detailed in Table 3.

Table 3. Opinion Regarding Student Readiness

Statement	Participant
Student readiness is one of the causes of significant success in learning. This also applies to the implementation of green skills in learning. I highlight the readiness of students in terms of awareness in preserving the environment. This reinforcement is very important before learning, because if students have high awareness, then the willingness to implement green skills during learning will also be high	Teacher 1 and 4
The most important readiness in students before applying green skills through learning is to increase their learning motivation. This motivation is related to the urge to make their jobs green when they graduate	Teacher 9

Next, talking about the readiness of infrastructure, an important topic is related to infrastructure with basic ingredients for a good life, having the ability to facilitate social relations, and being able to provide occupational safety and health. Such infrastructure is intended to provide materials and tools to ensure a good life during learning and is able to provide an overview of real life related to the environment according to the context and field

being studied. Then infrastructure must also be able to bridge students in building social relations between students, with work, and with the community. Finally, infrastructure must also be able to facilitate students in implementing occupational safety and health during learning, especially in carrying out practicals. Some of the teachers' opinions collected regarding infrastructure readiness are detailed in Table 4.

Table 4. Teacher's Opinion Regarding Infrastructure Readiness

Statement	Participant
Infrastructure readiness is one of the causes of significant success in learning, especially practice in vocational education. In the context of implementing green skills through learning, I highlight the readiness of infrastructure in terms of its function to be able to provide a good life during learning and to be able to provide an overview of real life related to the environment according to the context and field being studied	Teacher 1, 2, 3 and 4
The most important aspect in providing infrastructure is its ability to bridge students in collaboration and build relationships with others. This is important considering that green learning requires collaboration with various interested parties, such as society and work	Teacher 5 and 6
The most important readiness in infrastructure procurement before implementing green skills through learning is its ability to guarantee occupational safety and health	Teacher 9

During Green Behavioural Activities

Green behavior activities are a core aspect of the green skills-based learning process in vocational education. This behavior becomes an important parameter to what extent green skills are reflected in students. In this regard, we reveal three important themes during learning which are included in the broad scope of activity behavior in students in applying green skills during learning. The three important themes are the behavior of rethink emphasis, its impact on learning, and problems that arise during the implementation of green skills as show in Figure 3.
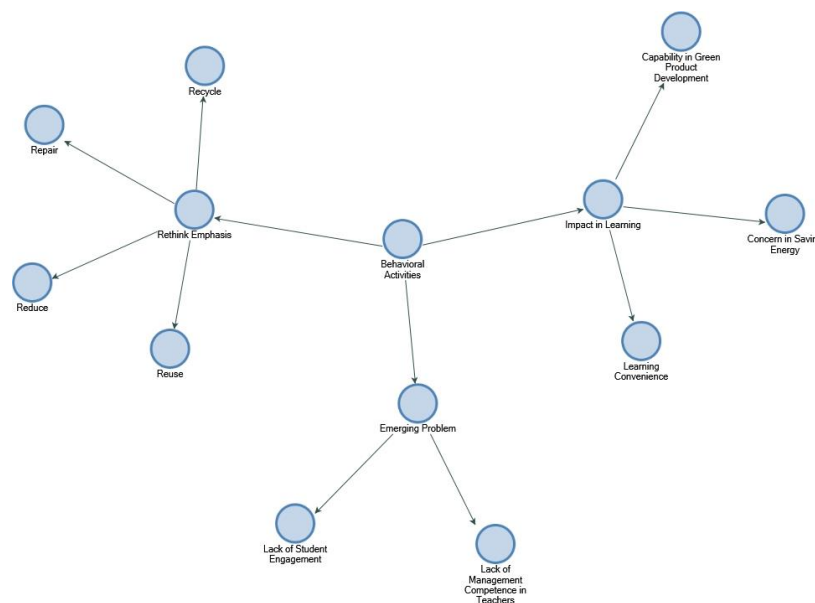

Figure 3. During Green Behavioural Activities

As presented in Figure 3. The positive influence of green behavior during learning that appears is learning comfort, which is related to the emergence of high learning motivation, totality in learning, and oriented towards high learning enthusiasm. Even though actually green project-based learning in vocational education is still minimally implemented, through the implementation of green skills, the ability to produce green products increases. This indicates that vocational learning has high potential in producing green products to solve environmental problems.

Rethink emphasis is a big topic of green behavior which includes rethink, refuse, repair, reduce, reuse, and recycle. However, on this topic, only four of them emerged based on the experiences of teachers and students while implementing them. Then, the perceived influence of the implementation of green skills is related to the convenience of learning in students, concern for saving energy, and ability to develop green products. The last major aspect during implementation was the problem that emerged, which was found to be related to a lack of student involvement and a lack of management competence in teachers.

The main behavior that emerges is rethink emphasis, which relates to behaviors that can be used in the classroom to direct discussions and green activities. Even though there are actually six rethink emphasis behaviors, according to what the teacher said, there are only four things that are usually applied. These four things are reuse, reduce, repair and recycle. This indicates that vocational learning is still limited to just four rethink emphasis behaviors, and still requires understanding and re-orientation strengthening, especially on the teacher as the manager of learning. Opinions regarding the rethinking of emphasis behavior from several teachers and students implementing green skills-based learning are detailed in Table 5.

Table 5. Opinions of Teachers and Students Regarding Rethink Emphasis Behavior

Statement	Participant
Related to student behavior during learning, what is seen is innovative behavior in reusing work materials that have the potential to damage the ecosystem but can be reused for the utilization of other aspects of work	Teacher 1, 4 and 9
In learning, I often find waste that is actually still suitable for use as practice material. Here I used to reuse it in practice in vocational education	Teacher 2, 6, 7 and 8
The behavior of reducing as much as possible the use of materials or energy that can only be used in a limited way appears in practical activities while I accompany students. Here students understand related to the management of the use of limited and non-renewable resources	Teacher 1, 5 and 6
I am very concerned about the limited resources, especially from nature which is decreasing drastically. I feel as a student I have to be able to prevent it, so I make it happen through the learning that I do	Student 3 and 4
Based on concerns about environmental damage caused by industry, especially the disposal of waste tools and chemicals, students try to behave innovatively in repairing work materials or tools that have the potential to become waste contributing to ecosystem damage	Teacher 1, 8 and 10
I highlight the negative contribution of the industry which pollutes the environment, I usually make improvements to tools and materials, so that they can be used for practice again without throwing them away	Student 1, 6 and 8
Recycling is a student behavior that is often carried out, which is related to the recycling of waste that can be used for practice and replaces materials that are limited and have a negative impact on the environment	Teacher 5 and 9

Then the emergence of concern in saving energy becomes a positive impact resulting from the green behavior that exists in students during learning. Opinions regarding the impact of green behavior from several teachers and students implementing green skills-based learning are detailed in Table 6.

Table 6. Opinions of Teachers and Students Regarding the Impact of Green Behavior

Statement	Participant
I feel that students have high learning comfort while implementing green skills-based learning. This is increasingly visible in terms of the high motivation of student learning and the support of totality in completing learning tasks at school	Teacher 6 and 8
I feel very comfortable when implementing green skills-based learning, and this directly increases the enthusiasm for learning	Student 3, 6 and 8
Students often make products based on actual problems that occur in the field. Green products are produced as a form of concern for the environment, and some can even be sold in the community	Teacher 1 and 5
I always focus on saving energy during learning, especially during practice. Where this is very important to do, considering that energy such as electricity, clean water, and the like is very important to save as a need for continuous learning	Student 4, 6 and 7

During green skills-based learning, several problems arise related to the obstacles and challenges faced by students, thereby hindering their green behavior. Based on the opinion of several teachers, there are two significant obstacles and they often face during learning, namely the lack of overall student involvement. This was observed when learning, there were still many who were passive in discussing problem solving in green skill-based learning. Then, from the teacher's side, they admit that they still have limitations in managing green skills-based learning. This indicates that they actually still need important strengthening regarding green learning management. Opinions regarding the problems during the implementation of several teachers and students implementing green skills-based learning are detailed in Table 7.

Table 7. Opinions of Teachers Regarding Problems During the Implementation of Green Skills-Based Learning

Statement	Participant
During the implementation of green skills-based learning, I felt a lack of student involvement during learning evenly. Many students who are passive are reluctant to discuss with their friends	Teacher 1, 2, 3, 4, 7 and 9
The problem that I complain about is the lack of understanding in managing green skills-based learning in an effective and efficient manner. I feel the need to strengthen competence in this regard	Teacher 5, 6 and 10

Green Behavioural Evaluation

Green behavior valuation is the last topic which is very important for the sustainability of the implementation of green skills-based learning. This evaluation will later be used as material for improvement and parameters of how far success has been achieved. Based on the perceptions of several teachers, they highlight deficiencies that must be taken

into consideration in future improvements. There are two crucial deficiencies that must be evaluated by schools, especially vocational education. These two deficiencies lead to a lack of competency in managing green skills-based learning in teachers. The second is related to the lack of comprehensive planning in terms of achieving green competencies and the limitations of important infrastructure. Departing from these two things the main evaluation is to increase the competence of green skill-based learning management in subject teachers. Green behavioural evaluation is show in Figure 4.
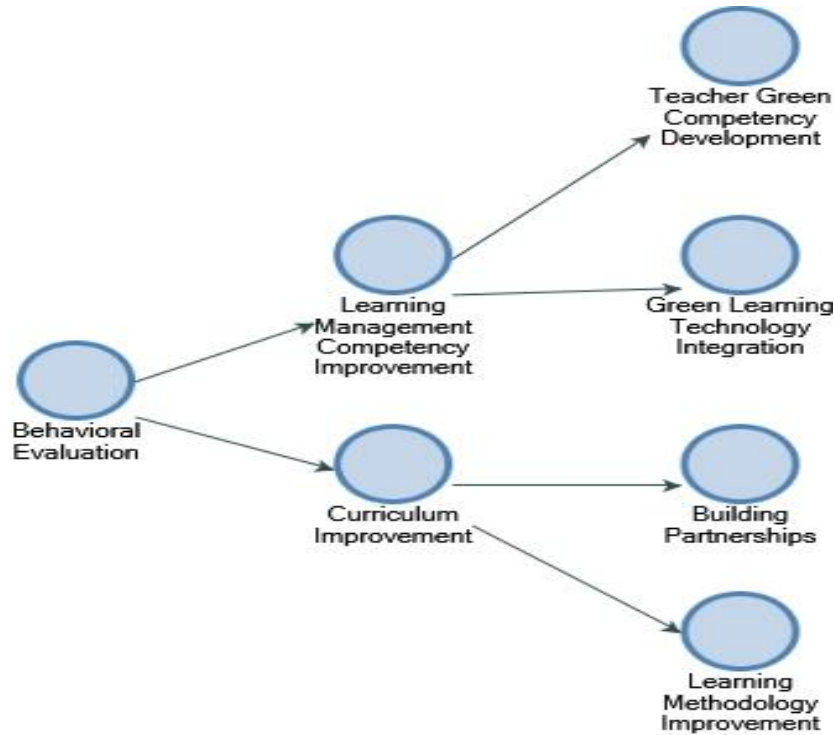

Figure 4. Green Behavioural Evaluation

Then the second relates to curriculum improvement. Perceptions about teachers' opinions as evaluation material are detailed in Table 8.

Table 8. Opinions About Teachers' Opinions as Material for Evaluating Green Behavior

Statement	Participant
An important aspect that must be carried out by schools, especially vocational education, is related to the provision of green learning management-based training. This must be done bearing in mind that green skills are still not very familiar to teachers, so the actual aspects of green skills must be given to teachers, so that in managing learning they become more aware of the stages and procedures	Teacher 1, 2, 3, 6 and 8
Increasing green skill-based learning management competencies includes developing teacher green competencies and training on the use of green technology in learning	Teacher 1, 2 and 6
Improving the curriculum is an absolute aspect that must be carried out by schools in improving the quality of green skills-based learning. Activities that must be carried out are building partnerships and improving learning methodologies	Teacher 2, 4, 5, 7, 9 and 10

Statement	Participant
Partnerships are needed in adjusting green competencies and procuring green infrastructure	Teacher 2, 4, 5 and 10
Meanwhile, improvement of learning methodology is needed to adjust learning content and its implementation	Teacher 7 and 9

Discussion

The importance of skills to support environmental sustainability and support sustainable development goals is very important to be addressed through learning in vocational education. This is considering that vocational education has the task of equipping students with work competencies, so this is closely related to the achievement of these goals (Hamza et al., 2020; Pavlova, 2009). Although the implementation of green skills in learning is still not very familiar to some vocational education, this research reveals important experiences related to this. This is based on the awareness that is starting to form within school members, bearing in mind that academic institutions are at the forefront in responding to the times that have an impact on the life sector. For vocational education, helping green jobs to help achieve sustainable development goals must be grown in students through learning. This is an interesting phenomenon as revealed in this study. Even though it has not been comprehensively implemented, some vocational education institutions are very enthusiastic about further developing their learning related to the implementation of green skills through activity behavior in daily learning. There are three major and highly related themes to support the achievement of green jobs and green industry through green skills-based learning in vocational education. The three themes are green skill planning activities, green behavior of students during learning, and evaluation of green behavior.

Planning activities are activities that are considered the most important before the implementation of the learning process. Especially in vocational education, where competency outcomes include cognitive, affective and psychomotor domains (Billett, 2011; Nurtanto et al., 2021). Planning broadly includes formulating competency outcomes, formulating learning strategies, planning human resources (teachers), and procuring infrastructure (Hall et al., 2020; Kooli & Abadli, 2021). In the context of green skills-based learning, there are slight differences in what is done when planning, which includes formulating competency outcomes, ensuring student readiness, and procuring green infrastructure. In terms of planning on competency outcomes, making green products is the main achievement that students must have through learning. Through making products, students are given the opportunity to analyze the potentials that are the focus of making products to deal with problems in the environment. Previous research revealed that project-based learning is a model capable of shaping green behavior in students (Handayani et al., 2021; Kaliappan & Hamid, 2021; Wang et al., 2020).

The product manufacturing process begins with real problems in the field and product development is carried out to overcome these problems. Furthermore, several teachers revealed that the important key as competency achievement was related to green problem-solving abilities. This is very consistent with the process of analyzing the causes of environmental disturbances in the context of the studied field. Problem analysis skills are needed for students in exploring environmental issues that require green problem solving solutions (Bali Swain & Yang-Wallentin, 2020; Van Dijk-Wesselius et al., 2020). Finally, the competency achievement that is also important is related to the ability to save energy. Where this is important as an effort to save non-renewable energy. As revealed by previous research that saving energy is one of the main focuses in various countries as an effort to achieve sustainable development goals (Mao et al., 2019; Mohd Zubir et al., 2021).

Furthermore, there are three important aspects during the implementation of green skills, namely rethink emphasis behavior, positive impact on learning, and problems that arise during implementation. Behavior rethink emphasis, which relates to behaviors that can be used in the classroom to direct discussions and green activities. Even though there are actually six rethink emphasis behaviors, according to what the teacher said there are only four things that are usually applied. Previous study explained that the ideal rethink emphasis is six things known as 6R, namely rethink, refuse, repair, reduce, reuse, and recycle (Pavlova, 2009). Four things based on the experiences of teachers and students are reuse, reduce, repair and recycle. This indicates that vocational learning is still limited to just four rethink emphasis behaviors, and still requires understanding and re-orientation strengthening, especially on the teacher as the manager of learning.

Green behavior applied in learning has a positive impact on developing student competencies. It can be seen that they have the ability to develop green products that are useful for solving environmental problems. In addition, the convenience of learning is a significant impact arising from the implementation of green skills-based learning. Students are also able to save energy significantly which is an important aspect of greening their jobs. Previous study states that green skills that are applied properly through learning will result in high enjoyment in learning (Gough et al., 2020). On the other hand, students will also have attitudes and skills in energy management and reprocessing of waste originating from learning activities (Cabral & Lochan Dhar, 2019; Mohd Zubir et al., 2021).

However, it turns out that several problems have arisen related to the constraints and challenges faced by students, thus hindering their green behavior. These problems are related to the lack of overall student involvement. This was observed when learning, there were still many who were passive in discussing problem solving in green skill-based learning. Then, from the teacher's side, they admit that they still have limitations in managing green skills-based learning. This indicates that they actually still need important strengthening regarding green learning management (Salleh et al., 2020; Yafi et al., 2021). According to several previous studies, the biggest challenge in implementing green learning is the readiness of teachers and students which refers to the ability to manage green learning and how to control students during learning (Onori et al., 2018; Walker et al., 2021).

Finally, based on the experience of implementing green skills-based learning, the teacher suggests several aspects to be used as evaluation material. The importance of e-evaluation is related to improving the curriculum and increasing the competence of managing green skills-based learning in subject teachers. This is very rational, considering that the curriculum determines the success rate of implementing a learning program. In it aspects of the formulation of learning competency outcomes, learning content, to learning assessments are implicitly stated, thus providing guidelines in the learning process (Pavlova & Singh, 2022; Sern et al., 2021; Young & Hordern, 2020). Then green skills are not yet familiar to be implemented in learning. So it is very necessary to develop green learning management competencies for teachers, considering that teachers are the most important human resource in facilitating green learning.

4. CONCLUSION

Perceptions of learning actors (teachers and students) about green skills have made fundamental changes in increasing the capacity and capability of vocational education in implementing them. Their experience during the implementation of green skills also provides an overview of green behavior during learning, which includes rethink emphasis, impact on learning, and problems that arise. The teacher's experience in the proposed green skills planning is related to green competency outcomes, particularly in providing an overview of

the green competencies to be achieved. The teacher's experience is also related to planning infrastructure needs and student readiness in terms of environmental awareness and motivation. As long as its implementation is oriented towards the behavior of reuse, reduce, repair and recycle.

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