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Implementation of Blended Learning in Project-Based Learning Models in Vocational Schools in North Sulawesi

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ABSTRACT

Blended learning is a learning model that integrates online and offline learning. This article explains how blended learning can be applied to project-based learning in SMK. This article also discusses the benefits and challenges of implementing blended learning and how teachers can overcome these challenges. This research uses a qualitative descriptive method which is a research method that refers to the collection and analysis of non-numeric data to answer research questions. The results show that blended learning can increase student motivation and participation in project-based learning at SMK. The implementation of blended learning can also facilitate students in developing critical, creative, and collaborative skills needed in the world of work. It is hoped that this article can provide insight and inspiration for vocational teachers in improving the quality of project-based learning through the implementation of blended learning. This study concludes that blended learning can increase student participation in learning, optimize the use of technology, and improve student learning outcomes. This study recommends that the implementation of blended learning can increase student participation and motivation in learning, as well as help students to develop critical thinking skills, creativity, and teamwork.

Keywords: blended learning, model pembelajaran, project, SMK

INTRODUCTION

The development of information and communication technology has had a major influence on the education system. One of the impacts is the emergence of a new learning model that is more

innovative and flexible, namely blended learning (Akbar, 2018). On the other hand, SMK as an educational institution that has the goal of preparing students to become skilled and ready-to-use workforce in the world of work needs to implement a learning model that can facilitate students in developing critical, creative, and collaborative skills.

The problems raised in research on the implementation of blended learning in project-based learning models in Vocational High Schools can be described as technical challenges in operating online technology that teachers and students may not be able to master. This technical challenge can be identified as difficulty accessing a stable and fast internet network, especially in remote areas. Not all students or teachers have adequate technological devices such as laptops, tablets, or smartphones, and these devices may also not always support all types of online learning applications (Sukardi, 2017). Not all teachers or students understand the technology and online learning applications well, so they cannot maximize the use of technology in the learning process. The occurrence of technical errors such as system errors, disconnected internet networks, or connection problems can disrupt the learning process (Arum, 2015). To overcome this technical challenge, several actions can be taken such as providing stable internet access and adequate technological devices for students and teachers, technology training for teachers and students, as well as adequate technical support during the learning process. By taking this into account, it is hoped that the implementation of blended learning can run well and can provide maximum benefits for students and teachers in SMK. Other problems can be identified, such as challenges in managing time between online and offline learning to keep it balanced and effective. The challenge of managing time between online and offline learning so that it remains balanced and effective is a problem that is often encountered in the implementation of blended learning. This can be seen from the difficulty in determining the right time to integrate online and offline learning so that they do not collide or overlap. Students may find it difficult to divide their time properly between online and offline learning so an imbalance in time allocation can occur and academic performance can be disrupted (Kember, 2016). Teachers may find it difficult to manage their time to prepare online and offline learning materials in a balanced and effective manner. There is a risk of overload for students and teachers if not managed properly, which can lead to burnout, decreased motivation, and increased stress levels. To overcome this challenge, several actions need to be taken such as a balanced distribution of online and offline learning time, setting clear and structured schedules, and learning that is carried out in a flexible and adaptive manner. In addition, it is important to involve students and teachers in decision-making and time management processes, so as to identify individual needs and take student and teacher preferences and time availability into account. Thus, it is hoped that the blended learning process can run well, and effectively, and provide optimal benefits for students and teachers (Hamalik, 2016). The next challenge is the challenge in motivating students to learn independently and be responsible for the given project. This can be identified through the lack of motivation and interest in students in learning, making it difficult for them to carry out their assignments seriously and responsibly.

Students may not understand the goals and benefits of project-based learning and how to carry out assignments independently. There is a tendency for students to rely on the teacher in carrying out assignments and projects, and are not in the habit of taking responsibility independently. There are

many external factors that can influence student motivation and interest, such as family support, social environment, or personal problems. To overcome this challenge, it is necessary to take several actions such as providing a clear and structured understanding of the objectives of project-based learning and its benefits, providing support and motivation for students, and providing rewards for students achievements who have successfully completed assignments independently and responsibly (Hew, 2015). In addition, it is important to pay attention to external factors that influence student motivation and try to adapt learning to make it more relevant to students' needs and interests. Thus, it is hoped that students will be more motivated to learn independently and be responsible for the given project. Another challenge is the challenge in evaluating student learning outcomes obtained through online and offline learning. This can be seen from the absence of clear evaluation standards in blended learning, making it difficult to evaluate student learning outcomes consistently. It is difficult to determine how to measure student success in online and offline learning separately and then integrate it into the final assessment. Limited time to complete the evaluation because of the time needed to provide feedback and provide an assessment of student work. There is no evaluation system that is well integrated between online and offline learning systems, which may result in incomplete or even conflicting information (Kurniawan, 2018). To overcome this challenge, it is necessary to take several actions such as defining clear and measurable evaluation standards, developing appropriate evaluation tools to measure student learning outcomes effectively and efficiently, and ensuring that the evaluations provided cover both online and offline learning. In addition, it is important to pay attention to other factors that can affect student learning outcomes such as the learning environment, family support, and student motivation (Kusuma, 2017). Thus, it is hoped that the evaluation of student learning outcomes can be carried out more effectively and efficiently in blended learning at SMK.

The novelty in this study is the application of a project-based learning model with a blended learning approach in the SMK environment in North Sulawesi. In addition, this research also explores challenges and solutions in implementing blended learning in a project-based learning model, which can make a new contribution to the development of education in Indonesia. This research also contributes to overcoming some of the problems that may occur in the implementation of blended learning, such as technical challenges, time management, student motivation, and evaluation of student learning outcomes. Therefore, this research can be a reference for the development of project-based learning models that are more innovative and effective in dealing with challenges and needs in the world of education today. In the context of North Sulawesi, this research can be a source of information and guidance for other educational institutions in adopting a blended learning approach in project-based learning. Thus, this research makes a positive contribution to the development of education in Indonesia, especially in terms of the application of technology in learning and the development of a more innovative and relevant curriculum.

Therefore, this article discusses how the implementation of blended learning can be applied in a project-based learning model in Vocational High Schools, with the aim of improving the quality of learning and developing student skills needed in the world of work. This article also discusses the benefits and challenges of implementing blended learning and how teachers can overcome these challenges. It is hoped that this article can provide insight and inspiration for vocational teachers in

improving the quality of project-based learning through the implementation of blended learning. Thus, this article is expected to make a positive contribution to the development of the world of education, especially in SMK.

METHODS

The method used in this research is the descriptive qualitative method. The qualitative descriptive method is a research method that refers to the collection and analysis of non-numeric data to answer research questions. This method focuses on collecting data through interviews, observation, literature studies, and others, as well as analyzing the data in a systematic and structured way. In a qualitative descriptive method, researchers study phenomena in natural contexts, with the aim of understanding human processes and experiences, as well as understanding the concept or phenomenon being studied in more depth. Data collected in qualitative descriptive methods are usually in the form of words, not numbers or quantitative data. The process of data analysis in a qualitative descriptive method involves grouping, categorizing, and interpreting data, thus enabling researchers to identify themes and patterns that emerge from the data. The results of qualitative descriptive methods are usually in the form of descriptions, narratives, or interpretations that describe the experience or process being studied. This method can help researchers to produce detailed and in-depth descriptions of the phenomenon or concept being researched, as well as assist in the development of new theories or concepts.

Data collection techniques are obtained in several ways, namely:

1. Literature study

Literature studies are used to obtain information and references related to project-based learning models and blended learning. This step can also help researchers to find problems and challenges that may arise in implementing this approach.

2. Observation

Observations were made to obtain an overview of the implementation of project-based learning in Vocational Schools in North Sulawesi and to identify potentials and challenges in implementing blended learning.

3. Interview

Interviews were conducted with teachers and students to obtain information regarding their experiences and perceptions of project-based learning and blended learning.

4. Data analysis

Data obtained from literature studies, observations, interviews, and questionnaires were analyzed using a qualitative descriptive analysis technique to identify problems and challenges in the implementation of blended learning in project-based learning models in Vocational Schools in North Sulawesi.

5. Solution development

Based on the results of data analysis, researchers were able to develop solutions to overcome challenges in implementing blended learning in project-based learning models in Vocational Schools in North Sulawesi.

6. Implementation

After the solution has been developed, the next step is to implement it in a project-based learning model at SMKs in North Sulawesi and evaluate the results.

RESULTS AND DISCUSSION

The increasing level of student participation

The results of the analysis conducted on SMK students in North Sulawesi in the use of blended learning are shown in Table 1

Table 1. Student participation rate

No	Class Students	Student participation rate (%)
1	Class Students X	88%
2	Class Students XI	85%
3	Class Students XII	82%
	Average	85%

The results of this study indicate that an average of 85% of SMK students experience an increase in participation in learning that uses blended learning to work on project-based learning. Class X students are students with the highest participation rate of 88%. While the lowest was class XII students who reached 82%. There is still a shortage in the participation of vocational students due to the uneven distribution of digital infrastructure available in North Sulawesi. In addition, the availability of both hardware and software devices also influences student participation in the use of blended learning.

The findings of this study explain that blended learning can increase the level of student participation in learning. The combination of online and offline learning allows students to study learning material flexibly and independently, so as to increase student motivation and involvement in the learning process. In online learning, students can choose the right time and place to study and can deepen their understanding of the material by utilizing various available sources of information. Whereas in offline learning, students can interact directly with teachers and classmates, which can help them understand the material and work on projects effectively (Sholihin, 2017).

With a combination of online and offline learning, students can experience a more varied and interesting learning experience. In addition, project-based learning in blended learning can also motivate students to learn actively and independently, because students are given the responsibility to produce quality final products (Means, 2014). Previous research has shown that the implementation of blended learning can increase the level of student participation in learning because students feel more active and involved in the learning process. This can help students to achieve better learning outcomes and prepare them to face the increasingly complex challenges of the world of work.

Increased student motivation

The results of this study indicate that there is an increase in student motivation in applying blended learning. This can be seen in the use of interesting and interactive technology that can increase students' interest in learning. In addition, students can access learning materials anytime and anywhere through online learning platforms, so they have more control over the learning process. In addition, project-based learning in the blended learning model allows students to be actively involved in learning, making them feel more involved and responsible for their learning outcomes. In a given project, students can also develop social skills and critical thinking skills, which can increase students self-confidence and motivation. See Table 2.

Table 2. Student motivation level

No	Class Students	Motivation level (%)
1	Class Students X	92 %
2	Class Students XI	90 %
3	Class Students XII	90 %
	Average	91 %

The results of this study indicate that an average of 91% of SMK students experience an increase in motivation in learning that uses blended learning to work on project-based learning. Class XI and XII students are the lowest at 90%. While the highest was class X students who showed an increase in motivation by 90%. This happens because SMK students who are Generation Z have a good level of digital literacy and are able to operate various electronic devices both hardware and software in learning. While there are still deficiencies because students are also identified as accessing social media and playing games so they are not serious about working on projects assigned by the teacher. In addition, the availability of both hardware and software devices also influences student participation in the use of blended learning. In using blended learning, teachers can also provide direct and continuous feedback through online learning platforms. This can help students to improve their weaknesses and improve their learning outcomes (Nurbekova, 2017). Thus, the use of blended learning can help increase students' motivation to learn and optimize their learning outcomes.

The technology platform used is usually in the form of a learning management system (LMS) or an online learning application. Some examples of technology platforms that are often used in blended learning include Google Classroom: This platform allows teachers to create and manage online classes and provide assignments and feedback directly to students. Moodle: This LMS provides various features such as online discussions, online assignments, and online quizzes. Edmodo: This platform is similar to Google Classroom and allows teachers to create online classes and provide assignments and feedback in real-time. Kahoot: An online learning application that allows teachers to create interactive quizzes and games to increase student participation in learning. Zoom: This platform allows teachers to conduct online classes in real time and interact with students via video conferencing. The choice of the right technology platform really depends on the learning needs and goals to be achieved (Dwiarti, 2018). It

is important to choose a technology platform that is easy to use and meets the needs of students and teachers to optimize the learning experience online and offline.

Improved critical thinking skills

The results of this study indicate that Blended learning can help students develop critical thinking skills by providing opportunities to study material independently through online learning and practice these skills through team-based projects in class. Online learning allows students to explore concepts and content in greater depth, while team-based projects allow students to apply the knowledge and skills they have learned in creative and innovative ways. See table 3

Table 3. Level of students' critical thinking skills

No	Class Students	critical thinking skills (%)
1	Class Students X	78 %
2	Class Students XI	79 %
3	Class Students XII	77 %
	Average	78 %

The results of this study indicate that an average of 78% of SMK students experience an increase in critical thinking skills in learning that uses blended learning to work on project-based learning. Class XII students are the lowest at 77%. While the highest was class XI students who showed an increase in motivation by 79%. This is because vocational students have been able to study independently through an online platform, which allows them to choose learning content that suits their needs and interests. This allows students to be more active in the learning process and can improve their ability to solve problems in a creative way. In addition, students participate in collaborative-based projects, where they have to think critically in finding solutions together with their friends. Within the context of this project, students will learn how to work effectively in teams and how to think critically in evaluating alternative solutions. Another advantage is that students are able to use technology and digital learning tools, and can develop their critical thinking skills in accessing, evaluating, and organizing information from various sources. This will help them develop better critical thinking skills in solving complex problems and making the right decisions (Lestari, 2019). While some deficiencies such as limitations in social interaction where online learning tends to reduce students' social interaction, which can affect their ability to learn from others and develop social skills (Suyatna, 2018). In addition, limited access to technology means that not all students have access to the technology needed to study online. This can limit students' ability to develop critical thinking skills through the use of technology (Siemens, 2015). Other drawbacks such as limited supervision in online learning, and supervision of students becoming more difficult because students are not in physical classes. This can affect the teacher's ability to identify student problems and provide assistance according to their needs (Maryani, 2020). And lack of limited student involvement because not all students are motivated to learn independently and may need more intensive guidance from the teacher. In the context of blended learning, students who are less motivated may experience difficulties in developing critical thinking skills independently.

Increased Creativity

The results of this study found that Blended learning can also help students to develop creativity skills by providing opportunities to create new projects that challenge them to think creatively and innovatively. Online learning can help students develop their creativity by introducing new concepts and providing inspiration, while team-based projects can help students put their creativity into practice. See Table 4.

Table 4. The level of student creativity

No	Class Students	level creativity (%)
1	Class Students X	85 %
2	Class Students XI	86 %
3	Class Students XII	88 %
	Average	87 %

The results of this study indicate that an average of 87% of SMK students experience an increase in creativity in learning that uses blended learning to work on project-based learning. Class XII students are the highest at 88% experiencing an increase in creativity. While class X students were the lowest at 85% there was an increase in creativity. This happens because vocational students can increase their creativity in learning because they use a variety of different media and resources, both online and offline. In blended learning, students have more opportunities to interact with various technologies and applications, such as learning videos, digital presentations, and online learning platforms. This allows students to express themselves more creatively and draw their attention to learning (Singh, 2016). In addition, project-based learning also encourages students to think creatively in solving problems and completing assigned tasks. However, blended learning also has drawbacks for SMK students such as the use of digital technology can reduce the social skills and creativity needed in direct interactions between students and teachers or between students with each other. In addition, students who are less skilled in using digital technology may have difficulty participating in blended learning (Yusoff, 2017). Therefore, it is important for teachers to provide adequate training and technical support to students so that they can maximize their blended learning experience. Finally, the use of technology in learning can also lead to a digital gap between students who have access to technology and students who do not have access, which can affect student creativity (Yusoff, 2018).

The results of this study indicate that the use of blended learning can increase the creativity of students and teachers in several ways. First, by utilizing a variety of digital resources, such as videos, images, and audio, teachers can create more interesting and challenging learning experiences for students. In this way, students can respond and react more creatively to the information provided. Second, through online discussions and forums, students can share their ideas and views with one another, thereby enhancing their ability to think creatively and generate new ideas. In addition, by providing project assignments that are more open-ended and require creative thinking, students can train their creativity skills more intensively. Third, the use of technology in learning can also increase teacher creativity. Teachers can create more engaging and innovative learning materials, integrate

technology into their teaching, and make classes more interactive and dynamic for students. In addition, teachers can use technology to facilitate collaboration between students and increase their understanding of certain topics. Overall, the use of blended learning can help increase student and teacher creativity by leveraging technology, discussing ideas, and providing more open and challenging assignments.

Improved Teamwork Skills

Blended learning can also help students to develop teamwork skills by providing opportunities to work together on team-based projects that demand better collaboration and coordination. Students will learn to build strong partnerships, listen to and respect the perspectives of others, and work together to achieve common goals. Team-based projects can also help students expand their social network and introduce them to people from different backgrounds. See table 5

Table 5. Level of Teamwork Skills

No	Class Students	Teamwork Skills level (%)
1	Class Students X	92 %
2	Class Students XI	93 %
3	Class Students XII	91 %
	Average	92 %

The results of this study indicate that an average of 72% of SMK students experience an increase in Teamwork Skills in learning that uses blended learning to work on project-based learning. Class XI students are the highest at 93% experiencing an increase in Teamwork Skills. While class XII students were the lowest at 91% there was an increase in Teamwork Skills. This shows that blended learning has enabled students to have access to a variety of learning resources. In blended learning, students have access to various learning resources such as books, online materials, videos, and other interactive multimedia. This allows students to create ideas and new ideas based on the variety of learning resources they receive. In addition, students are also more flexible in the use of time and place. In blended learning, students can access learning materials anytime and anywhere. This allows students to learn and create in a more flexible and comfortable environment for them (Rahman, 2017). On the other hand, students are able to collaborate online. This is because Blended learning also allows students to collaborate with their classmates online. This widens opportunities to share ideas and strengthens students' creative abilities in co-creating projects. Another thing is the use of creative technology that makes Blended learning enables students to use a variety of creative technologies such as graphic design software, animation, and multimedia processing. The use of this technology can improve students' creative skills in making creative products. However, some deficiencies such as limited internet access and technology have affected students, especially those living in areas with limited internet and technology access, which may have difficulty accessing content and online learning tools, thereby limiting their creativity in using technology for learning (Hidayat, 2019). In addition, technical challenges such as the use of new online learning technologies and tools can be difficult for students who are unfamiliar with or unskilled at using them, limiting their creativity in

creating and interacting with online content. Another thing that becomes an obstacle is the lack of support from the teacher, which means that students may not be able to reach their creative potential if there is no support from the teacher in providing guidance and feedback, as well as providing challenges that allow them to develop their creative skills. Also factoring in is the lack of variety and variety in teaching methods, even though Blended learning offers many options for teaching, sometimes teachers rely on the same way of teaching as they do in class. This lack of variety and variation in teaching methods can limit students' creativity in exploring and creating unique and creative solutions.

The results of this study indicate that the use of blended learning in learning can increase the creativity of students and teachers. In Blended learning, students and teachers have wider access to online learning resources, such as videos, images, and presentations that can inspire creative ideas (Harjono, 2021). In addition, Blended learning also encourages students to actively participate in learning, enabling them to interact with learning materials in more creative ways. Teachers can also use different technologies and tools to create and present more engaging and creative learning materials, such as video tutorials, interactive games, and online discussion forums. In Blended learning, the teacher can provide feedback that is more focused on student progress, which allows the teacher to provide more creative support for each student.

The results of this study also show that the implementation of blended learning can increase student participation and motivation in learning, and help students to develop critical thinking skills, creativity, and teamwork. However, there are also several challenges that need to be overcome in the implementation of blended learning, such as technical, managerial, and student motivational challenges (Warschauer, 2015). The results of this study can provide information about the effectiveness and efficiency of the implementation of blended learning in the context of learning in Vocational Schools in North Sulawesi, as well as provide insights for policymakers, practitioners, and researchers in the field of education.

CONCLUSION

This study concludes that the implementation of blended learning in a project-based learning model at Vocational High Schools in North Sulawesi provides significant benefits for students. Blended learning can increase student participation in learning, optimize the use of technology, and improve student learning outcomes. The technical challenges of operating online and offline technologies can be overcome with sufficient training and support for teachers and students. In addition, the challenges of managing time between online and offline learning and motivating students to study independently and be responsible for projects can be overcome with a flexible approach and by giving students the right responsibilities. In maximizing the use of blended learning, teachers can use various learning methods and techniques that suit the characteristics of students. In addition, continuous evaluation and student involvement in the evaluation process can help improve the quality of learning. Thus, the implementation of blended learning in a project-based learning model can be used as an effective alternative to improving the quality of learning in SMK. In its implementation, strong support is needed

from all related parties, such as the government, schools, teachers, and students, so that it can provide maximum benefits for education in Indonesia.

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