IMPLEMENTATION OF THE BLENDED LEARNING MODEL IN SOIL MECHANICS PRACTICE COURSES IN BUILDING ENGINEERING EDUCATION STUDY PROGRAM STATE UNIVERSITY OF JAKARTA

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Abstract

This study aims to describe the implementation of blended learning in the Soil Mechanics Practice course in the S1 Building Engineering Education study program at UNJ. The implementation of blended learning is divided into Online and Offline learning where Online learning is carried out through Google Classroom and Zoom and Offline learning is carried out at the Soil Mechanics Laboratory. This study uses a quantitative approach with a survey method. Respondents were 76 undergraduate students of Building Engineering Education who took the Soil Mechanics Practice course in the Even Semester of the 2021/2022 Academic Year. Collecting data using a questionnaire. The results of this study indicate that the application of blended learning received many positive responses from students who stated that learning was fun and increased creativity, activeness by 53.95% agreed, increased interest, readiness and awareness of student learning by 52.63% strongly agreed, but its application made students to spend more money and effort by 38.16% agreed. However, there was an increase in understanding of the material and practical skills by 42.11% agreed. Thus, it can be concluded that the application of blended learning for the Mechanical Engineering Practice course has a positive impact where lecturers and students are actively involved in learning activities both online and face to face.

Keywords: Implementation, Blended learning, Soil Mechanics Practice

Introduction

The learning model is a systematic framework (Gamal Thabroni, 2020) that manages the learning experience of students from the beginning to the end of learning (Ardiawan et al., 2020; Yazidi, 2014). In choosing the right learning model, teachers must be creative (E. Wulandari & Daryati, 2019) look at the situation and condition of students and lecturers, the nature of teaching materials and available media facilities (Rohana, 2020) because learning process consist of several components that interact with each other (Ilmi et al., 2012) and impact on improving learning outcomes (Ana, 2019). Implementation is the implementation or application (Kartika & Damayanti, 2018) of a plan, idea, concept, policy or innovation (Ridwan, 2017) that has been carefully prepared (Magdalena et al., 2020) to have an impact and achieve certain goals (Yuliah, 2020).

Currently, the Covid-19 pandemic is the biggest challenge for education systems around the world (Bordoloi et al., 2021). In dealing with this situation, a blended learning model is used (Wardani et al., 2018). who can do learning in the classroom and outside the classroom, and can take advantage of the help of technology in their learning (Hubackova & Semradova, 2016). Blended learning is learning that consists of face-to-face learning (Ramadania & Aswadi, 2020) and online (Batac et al., 2021). Blended learning provides flexibility (Qotrunnada & Khasanah, 2021) and great affordability (Suartama et al., 2019) for students to acquire knowledge (Bamoallem & Altarteer, 2022). In the implementation of blended learning, it is necessary to have a combination of technologies (Ekayati, 2018) to support learning (Istiqomah & Anggun, 2019) so that students can develop (Hima, 2017) and be able to learn independently (Ningsih et al., 2017).

The advantages of implementing blended learning are, namely, increasing learning independence, critical thinking (Sari, 2013), learning achievement (Perez-Llamas & Lopez-Bigas, 2011), motivation, interest, learning awareness (Rachman et al., 2019) so that it has a high level of student satisfaction with the blended learning learning model (Finlay et al., 2022).

The Soil Mechanics Practice course is one of the courses that must be followed by students of the S1 Building Engineering Education study program. The purpose of this course is so that students can develop their abilities in soil mechanics practice activities in the laboratory. The characteristics of practical learning are that students can use tools or objects to demonstrate the material taught (Ratnawati & Vivianti, 2020) and students can develop thinking skills (Frida Hanum Marbun, Nehru, 2017), creativity (Widodo et al., 2016), and learn various concepts practice them (Hapsari et al., 2015; Titin, 2016) so that it can have an effect to improve skills (Junaidi et al., 2020), classifying, communicating, measuring, predicting, and concluding (Candra & Hidayati, 2020; Fuentes-Pumarola et al., 2016).

Since the COVID-19 pandemic in early 2020, namely in the Even Semester of the 2020/2021 Academic Year, soil mechanics practice learning consisting of 12 basic competencies has been carried out online (online) using the google classroom platform, and zoom. The use of technology in learning can improve learning outcomes (Idiajir et al., 2021) However, with online learning, studentsonly learn theory and use video tutorial media to understand practicum activities. In the Even Semester of the 2021/2022 Academic Year, there is leeway in the implementation of practical learning. Through the Circular Letter of the Rector of the State University of Jakarta in 2021, practical activities are allowed to be carried out offline. So that the teaching lecturers decided that the learning of Soil Mechanics Practice was carried out with blended learning. Theory and learning videos are taught online using the google classroom platform, and zoom and practical materials are taught offline in the soil mechanics laboratory.

This research will discuss the Implementation of Blended Learning in the

Soil Mechanics Practice course at the Faculty of Engineering, State University of Jakarta Semester 2021/2022.

Research Methodology

The research method used is quantitative with survey method. The survey method is a study conducted by distributing questionnaires to obtain factual information from a population (Sari et al., 2020). The respondents in this study were students of the S1 Building Engineering Education study program who took part in the Soil Mechanics Practice course in the Even Semester of the 2021/2022 Academic Year totaling 76 students. The data collection technique carried out in this study was to use observation. Observation is a gathering activity (Surahman; Rachmat, M.; Supardi, 2016) or records an event in order to achieve research purposes (Syamsudin, 2015). The observations made are: 1) Researchers see firsthand offline learning activities in the Soil Mechanics Practice Laboratory, 2) Researchers see firsthand online learning activities on the Zoom Platform and Google Classroom. The second data collection technique is the collection of documentation such as lecture contracts (RPS), Learning Materials and Videos. The last data collection technique is to conduct a questionnaire survey of student responses to blended learning Soil Mechanics Practice using google form.

This study uses validity tests to measure the extent of the accuracy of a measurement with pearson (Nuryani, 2020) and reliability test to measure the extent to which a measurement can be trusted (Yusup, 2018) which refers to the Cronbach Alpha value (Riyanto & Hatmawan, 2020; Yusup, 2018). This test was carried out to 30 respondents of students of the S1 Building Engineering Education study program. In addition, a percentage formula is used to find out the percentage of responses to blended learning Soil Mechanics Practice.

Results and Discussion

The blended learning model is divided into two learnings, namely online learning (online) and offline learning (outside the network) (Hrastinski, 2019). Planning in blended learning is carried out through material analysis activities and learning outcomes that will be included in lecture contracts or Semester Learning Plans (RPS) as well as the preparation of blended learning syntax. The implementation of blended learning is planned to be carried out synchronously (face-to-face online and offline at the same time) (Dirgantoro & Soesanto, 2021) and asynchronous (distance learning at the same time) (Amadea & Ayuningtyas, 2020). This is done by paying attention to the learning objectives of Soil Mechanics Practice, where practicum learning activities are more dominant than theoretical learning. The RPS that has been designed will be the basis for the implementation of blended learning in the Soil Mechanics Practice course.

Online Learning

The initial stage in online learning is to create a class on the Google Classroom platform and instruct students to join the class. After that, the lecturer provides lecture contracts, learning materials and learning video links through the Google Classroom platform. In the results of the study (Untari & Millatussa'adiyyah, 2020) stated that google classroom plays a very important role in the learning process which is shown by achieving learning objectives effectively and efficiently. These learning materials and learning videos will later be explained by dosen through the Zoom platform. To increase student interaction and activity, dosen invites students to discuss and ask questions regarding learning materials and videos that have been discussed through the Zoom platform. It is not uncommon for students to provide opportunities for students to convey the results of their understanding during learning. The learning portion using the Zoom platform lasts for 100 minutes. In research by Liu & Ilyas (2020) explains that online learning based on zoom cloud

meetings affects improving learning outcomes. In addition to relying on the material that has been provided in online learning, dosen provides instructions to students to find other sources of information to enrich their knowledge.

Offline Learning

Offline (off-network) learning is carried out in the Soil Mechanics Practice laboratory. Laboratory learning is divided into 50% of students in one class can be allowed to enter and another 50% is carried out practicum in the following week. Learning begins with givinga brief explanation and demonstrating the practicum procedures/steps to be carried out. Before students do practicum, it is not uncommon for students to invite students to discuss and ask about the explanation of the implementation of the practicum. After that, itprovides opportunities for students to do practicum and demonstrate the material they have learned by themselves. To evaluate students' understanding in learning, theyassign assignments to students in the form of practicum results reports so that students can reflect, analyze and make conclusions from the practicum results. In this case, students will upload their assignments and lecturers will give their assessments on the Google Classroom platform. In research by Riasari (2018) blended learning provides an opportunity for students to discuss, interact and exchange opinions actively both during face to face and online learning so as to build relationships between the student's social environment. This is in accordance with research conducted by (Tamzysi, C., & Kristiyani, 2020) states that the blended learning method in practicum learning gets enthusiasm and satisfaction from students which is very high and can increase understanding in learning.

Student Responses to Blending Learning

Based on student responses to the implementation of blended learning above, it can be explained that almost 100% of respondents conveyed positive things about blended learning, for example, it can be seen that almost all students stated that blended learning in the Soil Mechanics Practice course makes learning fun and is still able to increase their creativity and activeness in learning. The results of this study are in line with research by Wardani et al. (2018) it was also revealed that blended learning can make the learning process in the classroom and online more enjoyable so that students are more interested in participating in learning. The research by Ratnawati & Vivianti (2020) also shows that the implementation of the blended learning method can cause pleasant situations but is still able to foster creativity and active attitudes of students so that students' critical thinking skills are increasing.
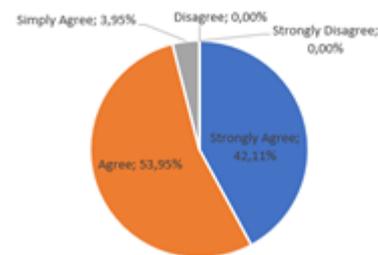

Figure 1. Blended learning diagrams make learning fun, increase creativity and activeness in learning

Almost all students showed an increase in interest, awareness and readiness to learn after blended learning was applied in the Soil Mechanics Practice course. These results are in line with research by Rachman et al. (2019) which explains that students' motivation, interest, and learning awareness increase after the blended learning model is applied. In addition, blended learning has also been integrated with the technology used, students also feel that they have flexible time to learn and feel easy to interact with teaching lecturers. These results are in line with research by Bowyer & Chambers (2017) in Endah Wulantina (2019) which shows that blended learning can increase the effectiveness of time in learning and there is a platform to conduct online discussions so that there are no restrictions in time and space.
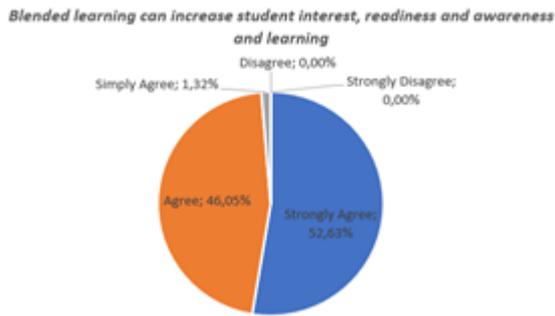
Figure 2.   Blended learning diagrams can increase students' interest, readiness and awareness and learning

Most students expressed some negative things in blended learning, for example they stated that they became more wasteful because they had to buy internet quota and they felt tired because they had to attend online and offline classes, but a small percentage of other respondents did not agree with this statement. The results of this study are in line with the research by Endah Wulantina (2019) which states that the blended learning method received a negative assessment from the aspect of efficiency because the blended learning method requires to use internet data packages. So, it needs the support of the Education Office to provide free hotspots placed at strategic points so that students are not burdened with the high cost of internet data packages. The results of the study by I. A. G. Wulandari (2021) said that students expect an internet quota because there must be adequate facility support for the implementation of learning.
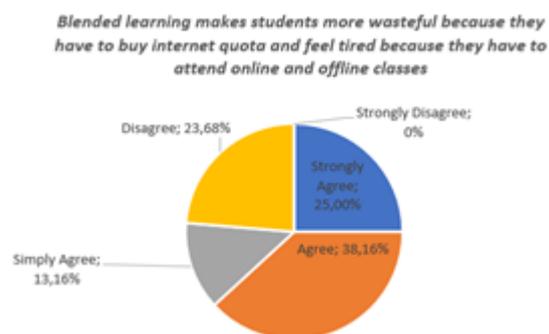

Figure 3.   Blended learning diagrams make students more wasteful

because they have to buy internet quota and feel tired because they have to attend online and offline classes

The negative statement above is actually felt, but there are other benefits of implementing blended learning. The results showed that most students experienced an increase in understanding the material and learning skills after blended learning was used in the Practice of Soil Mechanics. The results of this study are in line with the research by Fadhilatunisa et al. (2020) which shows that blendedlearning can have a good effect on improving student learning outcomesa. The results of the study by Bibi & Jati (2015) also showed that there was an increase in student understanding due to the application of blended learning model learning.
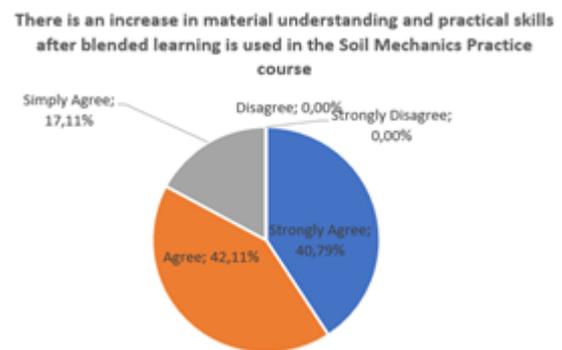

Figure 4.   Diagram improvement in material understanding and practical skills after blended learning is used in the soil mechanics practice course

Based on the discussion and research results above, it can be seen that the implementation of the blended learning model received a positive response from students of the Building Engineering Education study program, State University of Jakarta. There are only disadvantages in terms of efficiency in terms of cost and energy spent quite a lot.

Conclusion

Based on the results of the study, it was found that the implementation of blended learning in the Soil Mechanics

Practice course for the Even Semester of the 2021/2022 Academic Year can make learning fun, increase creativity and activeness in learning according to the presentation of student responses that agree by 53.95%. In addition, students' interest, readiness and awareness of learning increased according to the presentation of student responses who expressed strongly agree by 52.63%.

However, the implementation of Blended learning makes students more wasteful because they have to buy internet quota and feel tired because they have to attend online and offline classes, this is in accordance with the presentation of student responses who agreed by 38.16%. The implementation of Blended learning improves the understanding of material and practical skills in the Soil Mechanics Practice course, this is in accordance with the presentation of student responses that agree by 42.11%.

The suggestions or recommendations that can be used as a reference for further research are that blended learning can be re-done and developed again to balance student knowledge and skills in the Soil Mechanics Practice course because most of the positive impacts have been experienced by students who run blended learning.

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