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Analysis of Student Readiness for Blended Learning Model Implementation in Industrial Era 4.0

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ABSTRACT

Blended learning is an approach to learning that is carried out face-to-face and online by utilizing IT. On its implementation, universities have to consider various things including the attitudes or needs of students in blended learning to avoid failure. The aim of this study is to find out how students' attitudes towards various aspects of learning can affect their readiness in participating in the blended learning process. This research is a qualitative and quantitative descriptive study. Data were collected using questionnaire sheets distributed to 85 students of the Faculty of Tarbiyah and Teacher Training (FITK) UNSIQ. The data is data about students' attitudes toward six aspects of learning, namely learning in the classroom, online learning, learning flexibility, learning management, technology, and online interaction. This data can show its effect on the readiness of students to take part in blended learning. Other data in the form of interviews from students. The results of this study indicate that students' attitudes toward learning in the classroom are higher than online learning. However, blended learning can still be carried out with the consideration that the proportion of online learning is 30-37%. Good management and management in online learning is needed, one of which needs to be considered is the network and the technology. Future research that can be done by implementing blended learning that is designed creatively and innovatively to improve student understanding.

Keywords: Blended learning, industrial 4.0, student attitude

INTRODUCTION

Advances in information technology (IT) such as Web applications, mobile devices, and telecommunications have changed the design and learning process of higher education. Learning changes from classroom learning to online learning so higher educations have new paradigm in their teaching practices and the way their students learn (Bhakta & Dutta, 2016). Positive impacts from the integration of information technology in learning are increased motivation and increased student learning outcomes (Al-Hariri & Al-Hattami, 2017; Chen, Luo, Fang, & Shieh, 2018; Firdaus, 2016, 2017; Lin, Chen, & Liu, 2017; Lyu & Wang, 2018; Qi, 2018). In order to adapt to the changing trends in education, it is important for higher education to look for innovative solutions that can improve the learning environment for lecturers and students.

One of the innovative solution that can be applied is blended learning where modern technology is integrated into the learning process. Blended learning model is often used in learning. It can be used to respond the changes in educational paradigms that require many skills of students (Bonk & Graham, 2006; Bonk, Kim, & Zeng, 2006; Graham & Robison, 2007). The model uses a variety of pedagogical with various methods in learning, whether using technology or not (Verkroost, Meijerink, Linsten, & Veen, 2008). Blended learning

model can increase knowledge and satisfaction (Alsalhi, Eltahir, & Al-Qatawneh, 2019; Li, He, Yuan, Chen, & Sun, 2019), independence in learning and higher-order thinking skills (Kharb & Samanta, 2016).

Some previous research mostly focused on the positive influence or superiority of the blended learning model. The effectiveness of blended learning has a number of fundamental factors that provide challenges. One big challenge is how users can successfully use technology and ensure student commitment given the characteristics of students and the novelty of learning with technology (Hofmann, 2014). Therefore, it is important to ensure the readiness of several stakeholders in the implementation of blended learning. There is research that highlights the importance of perspectives from various stakeholders such as organizations, educators and students (Harris, Connolly, & Feeney, 2009). In addition, there are also other studies that discuss the relationship between student characteristics, design features and learning outcomes (Kintu, Zhu, & Kagambe, 2017).

Among these, students as students play the most vital role. Therefore, researchers are very important to assess the readiness of students to apply a fully blended learning model (Park & Choi, 2009). Student readiness is needed because in the blended learning model they are demanded to be more independent. In this learning model, students are required to carry out structured activities aimed at planning, managing and directing their learning activities and sharing learning responsibilities with their instructors (Tsai, 2010). In other words, student readiness is a prerequisite for the successful implementation of blended learning (Tang & Chaw, 2013).

Research on blended learning has been carried out mostly in western education. However, little research has been done in Indonesia to empirically examine students' attitudes towards various aspects of learning that can affect student readiness in blended learning. This study aims to find out how students' attitudes towards the six aspects of learning adopted from Tang, namely, learning in the classroom, online learning, learning flexibility, management of learning, technology, and online interaction (Tang & Chaw, 2013).

Students' attitudes toward the six aspects of learning will be examined to study their adaptability to blended learning. The first learning aspect is learning flexibility. Students have many responsibilities, such as work, study, and family commitments. Flexibility of learning enables students to balance their academic, work and family lives (Vaughan, 2007). Blended learning provides the benefits of time efficiency and location convenience for students (Brown, 2003). Students can access learning material on the web whenever and wherever needed (Akkoyunlu & Yilmaz-Soylu, 2008).

The second aspect of learning is online learning. Online learning gives students more time to reflect on their responses so they can express their thoughts better. This aspect facilitate the needs of introverted or uncomfortable students to share their views in front of others (Howard, 2009). Previous studies have reported that students who prefer online learning feel that they have quality time to think about and respond to asynchronous discussions more effectively (Collopy & Arnold, 2009; Howard, 2009).

The third aspect of learning is learning management. This aspect is an independent learning process where students make efforts intended to plan, to manage, and to direct learning activities and share learning responsibilities with their instructors (Tsai, 2010). It is an important aspect that contributes to stronger learning motivation and better time management when studying online. Blended learning provides autonomy for students to be responsible for their learning, which demands self-discipline and self-motivation (Smyth, Houghton, Cooney, & Casey, 2012).

The fourth aspect of learning is information technology (IT). Information technology is the main driver for blended learning. Digital tools can help build online communities across borders and time zones, which are more widespread than traditional

face-to-face communities (de L'Etraz, 2010). Easy access and good proximity to digital technology among students are prerequisites for the successful application of blended learning (Harris et al., 2009). Students can use technology to engage in learning activities anytime and anywhere (Glogowska, Young, Lockyer, & Moule, 2011; Lancaster, McQueeney, & Van Amburgh, 2011).

The fifth aspect of learning is online interaction. Interaction and discussion are important aspects in the learning process. It must be incorporated into the learning environment of blended learning (Harris et al., 2009). Online interaction can be done in the form of open dialogue or critical debate through asynchronous web-based discussion forums and so on (Garrison & Kanuka, 2004). Blended learning provides an unlimited collaboration platform for group-based learning (de L'Etraz, 2010).

The sixth aspect of learning is classroom learning. Classroom learning provides way of learning where students engage in spontaneous verbal communication in physical settings (Garrison & Kanuka, 2004). Experts agree that the class community offers a sense of real and meaningful interaction between learners and instructors which can not provides in online learning. Students who have a greater desire for face-to-face interaction are more likely to withdraw from online learning (Howard, 2009).

RESEARCH METHOD

The research method used is descriptive qualitative and quantitative research. Questionnaire sheets are used to collect data which are 34 items. Table 1 provides information about the summary of statement items for each aspect. Items are measured using a five-point Likert scale.

There are 85 valid responses were collected from physics education program students, who were in the third semester and above. The reason is the students has experienced one year in the classroom learning environment and they used technology widely. We reasoned that they were able to provide better insights into aspects of learning.

Data processing is done in a simple quantitative approach, using Microsof Excel 2013, which is tabulated and calculated as a percentage. Analysis of data in percentages is used to determine student attitudes toward aspects of learning.

Interview techniques are conducted for students to find out the students' attitudes towards the learning aspects and ask them to explain the reasons why they have such attitudes. Data validation is done by using triangulation of data collection techniques, by comparing the questionnaire collected and the results of the interview. Thus, students' actual readiness can be seen.

Table 1. Summary of construction items

No	Construct	Total item	Item
1	Attitudes towards learning flexibility	4	- I want to be able to fully access lecture material. - I want to decide for myself where I study. - I like to learn at my own pace. - I want to decide when I want to study.
2	Attitudes towards online learning	8	- I believe face-to-face learning is more effective than online learning. - I am comfortable with independent learning. - I don't refuse to have online class. - I like online learning because it provides richer learning content. - I want to reduce class time in class. - I prefer online class rather than face to face class. - I am bored when studying online. - I find it very difficult to study online.
3	Attitudes towards learning management	6	- I missed the assignment due date in online class. - I manage my time better when studying online. - I can study repeatedly via online. - Online learning motivates me to prepare well for my studies. - Online learning encouraged me to make plans. - Online learning makes me more responsible for my studies.
4	Attitudes toward technology	4	- I believe the Web is a useful platform for learning. - I am familiar with Web technology. - I believe Web technology is easy to use. - I think technology should be used in learning.
5	Attitudes towards learning in class	5	- I have a sense of being together when I meet other students in the class. - I like fast feedback when I meet my lecturer in person. - I believe learning through collaboration with other people directly is more effective. - I learn better through classroom-based activities directed by lecturers. - I learn better when someone guides me .
6	Attitudes towards online interaction	7	- I feel isolated in an online learning. - I am comfortable using Web technology to exchange knowledge with others. - I want to interact with my online lecturer. - I want to interact with other students outside the class. - I find it easy to communicate online. - I appreciate easy online access to my lecturers. - I can collaborate well with virtual teams in doing assignments

RESULT AND DISCUSSION

Questionnaires to determine student attitudes toward learning aspects are distributed to get information about their adaptability to blended learning. The data is analyzed to determine the readiness of students for the implementation of blended learning. The results of the questionnaire on student attitudes towards the learning aspects are presented in Table 2.

Table 2. Students attitudes towards aspects of learning

No	Aspect	Average score
1	Attitudes towards learning in class	4,65
2	Attitudes towards online learning	3,85
3	Attitudes towards learning flexibility	4,15
4	Attitudes towards learning management	3,92
5	Attitudes towards online interaction	3,81
6	Attitudes toward technology	3,96

Based on a questionnaire about students' attitudes towards several aspects of learning, several results have been found. First, students' attitudes toward learning in class get a value of 4.65 or in the percentage of 79% approval rate. Based on the results of interviews with students stated that they prefer to meet directly with other students when they have to do discussions than to meet online. However, there were also some students who expressed difficulty meeting face to face because of the problem of time sharing. Furthermore, students said that when learning in class tends to have a sense of togetherness compared to online. Direct guidance is also the reason students choose learning in class. They can easily ask various questions to get quick feedback from lecturers and from peers. But there are also those who think that, when learning in class is more boring because the lecturers tend to teach using the lecture method.

Second, the understanding of online learning gets a value of 3.85 or in the percentage of 65% approval rate. Compared to learning in class, online learning gets less positive aspects from students. Students feel that face-to-face learning is more effective than online learning for various reasons. Students are more difficult to understand the material during online learning. It is because of lecturers only provide material and lack of interaction, so students don't get feedback if they find it difficult to learn. But students also did not refuse online learning. Students can explore various materials or learning resources when learning online. In order to online learning to work well, it is necessary to have good management conducted by lecturers. As a study conducted by Owston et al, states that there is a positive relationship between student involvement in online learning and achievement (Owston, York, & Murtha, 2013). Online learning can be designed in such a way that students can be actively involved in learning and interacting with the instructor.

Third, students' attitudes toward the aspect of learning flexibility get a value of 4.15 or in the percentage of 71% approval rate. Some students made statements that they enjoyed learning at their own pace. They assume each student has their respective abilities in absorbing material. In terms of time and place of study, students choose to decide for themselves when and where they study. This is an advantage of blanded learning that is learning can be done anytime and anywhere. With blended learning, students get access and flexibility with one of the dimensions of time, place, speed, learning style, content, assessment or learning path (Müller, Stahl, Alder, & Müller, 2018).

Fourth, students' attitudes toward learning management get a value of 3.92 or a percentage of 67% approval rate. Students give responses that some of them can manage their time better when they study online. Students who can manage their time well in online learning because they have a high sense of responsibility for their learning. On the contrary, some students pay little attention to their own study time when studying online because there is no one watching and their motivation to learn is low. Students assume that they tend to miss due dates in collecting assignments compared to learning in class.

Fifth, students' attitudes towards online interaction get a value of 3.81 or in the percentage of 65% approval rate. This value is relatively low compared to the others. Students do not agree that online learning

can motivate them to prepare for good learning. They feel isolated in the online learning environment. For students who have low achievement, direct interaction is really needed to discuss in order to get a good explanation from the teacher or their peers about the material that is poorly understood. Another obstacle faced by students when interacting online is networking because not all students have good network access. For students who have difficulty accessing the internet, they feel uncomfortable using web technology or similar online communication to study or exchange knowledge with others. On the other hand, online interaction is also needed because it can be beneficial for students, which is to bring a real situation or environment as a source of learning. Based on research results, online interaction in learning in the form of online or virtual field trips can improve learning outcomes (Sriarunrasmee, Suwannatthachote, & Dachakupt, 2015)

Sixth, student attitudes toward technology get a value of 3.96 or in percentage of 67% approval rate. Students give responses that websites or online learning support applications can be useful and useful to them. However, students still feel doubt about the ease of use. Some students find it difficult and complicated to use various online learning support applications such as LMS or other multimedia applications.

Understanding student attitudes towards various aspects of learning can be important for assessing adaptability and readiness to participate in blended learning. Our findings indicate that students who have a positive attitude towards online learning, study management, online interaction, and learning flexibility are easier adapt to blended learning. The more positive the attitude, the more adaptable and the more ready to follow blended learning. This finding is in accordance with previous research (Brown, 2003; Collopy & Arnold, 2009; Garrison & Kanuka, 2004; Howard, 2009; Smyth et al., 2012; Tsai, 2010; Vaughan, 2007). In blended learning, students are more flexible in time and place and easy to access. Students enjoy greater autonomy over the progress of learning and have a greater sense of responsibility for their studies. Students who are disciplined can perform better because the speed of learning depends on each individual (Owston et al., 2013; Smyth et al., 2012). One key for students to have good performance in blended learning is to actively participate in learning activities. (Owston et al., 2013).

The attitude of students who are happy with learning in class also indicates their readiness to take part in blended learning. The stronger the need to learn in class, the less students reaadiness to take part in blended learning. The results of this study show that students' attitudes toward learning in class are higher than online learning even though online learning provides many benefits for students. In other words, there needs to be good management and management in implementing blended learning so that anomalies do not occur. Blended learning that should provide a good learning process will have the opposite effect. Blended learning must be designed as well as possible so that students have a positive attitude towards online learning, so that positive attitude will have an impact on the high motivation of students to take part in online learning.

When students' attitudes toward learning in the class are higher than online learning, it does not mean that blended learning cannot be implemented. Judging from the proportion of online learning materials, blended learning has a proportion of online learning of 30 until 79% (Allen, Seaman, & Garrett, 2007). So that it still allows blended learning to be carried out, considering learning in the classroom is also needed.

CONCLUSION

From the results of this study it was concluded that students were ready to take part in Blended Learning activities when viewed from their attitudes towards aspects of online learning and classroom learning.

But there needs to be good management and management of learning that is carried out online. In addition, network aspects need to be considered because not all students live in urban areas that have good internet access. Therefore it is necessary to prepare LMS or similar applications that can be accessed with a low network and easy to use.

Future research directions that can be carried out are implementing blended learning with various considerations that have been discussed previously. Blended learning can be designed creatively and innovatively to increase student understanding.

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