The Need of Blended Learning in Ecoliteration in the Era of Revolution of Industry 4.0 for College

Y Fitria[1], A K Kenedi[2]
Universitas Negeri Padang, Jl. Prof Dr. Hamka Air Tawar, Padang, Indonesia[1], Universitas Samudra, Jl. Meurandeh, Langsa, Indonesia[2]

{yanti_fitria@fip.unp.ac.id}

Abstract. This research is backed by the demands of Revolution of industry 4.0 that has transformed the world of education from traditional education to modern education by using various technologies. The Revolution of industry 4.0 also affects the environment that continues to be exploited without regard to its continuity. The research aims to know and analyze the need in the development of blended learning models in the efforts to increase the ecoliteration in the era of the Revolution of industry 4.0. This research is a qualitative descriptive research. Data collection techniques are observation and poll. The subject of this research is student college of PGSD who take the subject of natural science education (IPA 1) and the lecturers who teach the subject of natural science education (IPA 1) in PGSD. The object of this research is the need for the development of blended learning models in the efforts to increase the ecoliteration in the era of the Revolution of industry 4.0. The results show that the blended learning model needs to be developed in the effort to improve student ecoliteration in the era of the Revolution of industry 4.0. The implication of this research is that it can be used as the foundation for researchers and lecturers in developing blended learning models in the effort to improve student ecoliteration in the era of the Revolution of industry 4.0.

Keywords: Ecoliteration, Revolution, Industry 4.0, College

1 Introduction

The Revolution of industry 4.0 has been a major issue in the present era. The Revolution of industry 4.0 is a change in the era that enters the combination of internet technology [1] [2]. The Revolution of industry 4.0 is part of the development of the epoch that collaborates with intertechnological relationships in people's lives [3] [4]. The Revolution of industry 4.0 has a characteristic that all human needs are influenced by the Internet-based technology that can produce superior products [5] [6] [7]. The Revolution of industry 4.0 has spawned digital and internet-based modern technologies that make it easier for human life needs.

The Revolution of industry 4.0 has penetrated all aspects of human life such as economic, social, cultural and even educational aspects. The Revolution of industry 4.0 has entered into an educational aspect so that a transformation in the education system is needed. Therefore, the readiness of lecturers and students are required to follow these developments. The

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Revolution of industry 4.0 in education demands a traditional learning system to be a technology-based and internet-driven modern learning.

It is adapted to the condition of industry 4.0 that demands the use of technology. The Revolution of industry 4.0 demands a change [10] [11]. These changes can be implemented by innovating in the learning system in the classroom. Innovation in the Revolution of industry 4.0 in the field of education is necessary. The traditional learning paradigm must be transformed into modern learning. This is due to the demands of different graduates that must be produced in the era of Revolution 4.0 industry. In the era of the Revolution of industry 4.0 educational system should be able to graduate college students who are able to understand the technology as much as possible [12] [13]. Colleges as a higher education implementation should answer the challenge of the Revolution of industry 4.0 by creating innovations that can make the learning system in college a technology-based learning system.

College is an institution that produces graduates who have expertise in their fields. Hence it takes the effort in line with the development of the Revolution of industry 4.0. One of the efforts that can be done to create the learning system that uses Internet technology and one of the learning models that can be developed is blended learning. The blended learning is a learning that combines the concept of e-learning with a contemporary concept [14]. E-Learning is a learning system that can be done by students, anytime and anywhere without the need of meeting between lecturers and students, while traditional learning is a learning that allows the occurrence of meeting between lecturers and students. In other words, the blended learning is a learning that combines face-to-face learning with online learning.

The blended learning is a very flexible learning model that does not depend on time and place of learning. This is due the learning is carried out by using the computer system and will be continued in face-to-face learning [15] [16]. The blended learning has several advantages in the learning process. The blended learning is more effective than the face-to-face class. It improves student learning outcomes, increases communication activity between students with teachers, grows students' ability to use information technology, and save on spending [17] [18] [19] [20]. In addition, it is suitable for the current era that is in accordance with the characteristics of students who know the technology. Furthermore, it will help teachers easily to organize the learning process because material learning is adjusted to the process that will be implemented [21] [22]. Based on these advantages then the blended learning is very suitable to apply in the Revolution of industry 4.0.

The blended learning is very suitable to apply in the Revolution of industry 4.0. In addition, the blended Learning also support for the creation of students' ecoliteration skills especially in the era of the revolution of industry 4.0. The blended learning does not only rise the challenges that must be achieved but also the impact on the environment. The ability of Ecoliteration is a student's ability to know and understand the environment comprehensively [23]. In the era of the Revolution of industry 4.0 there are many massive environment exploitations that damage and threat life. Therefore, it needs to improve students' ecoliteration ability.

Based on the problem, it is necessary to develop a proper learning model for students in the revolution of industry 4.0 by regarding the ability of ecoliteration. Hence, the development that can be done is the development of the blended learning to improve student's ecoliteration ability. It is necessary to analysis the need of the blended learning to know the feasibility and the needs of the development process in effort to improve student's ecoliteration ability. This research is necessary to be carried out because the findings will be useful for further development.

2 Research Methods

This research is a qualitative descriptive study that aims to describe the findings that are collected, analyzed and concluded according to the research objectives. This research is conducted in the Department of PGSD FIP UNP. The subject of this research is 200 college students of first semester who take the subject of natural science education and six lecturers who teach natural science education. The object of this research is the need for the development of blended learning model in the effort to improve students' ecoliteration ability. Data collection techniques are observations and polls. The data collection instrument is an observation sheet used to describe real and visible conditions in the field as well as a poll used to know the report of a respondent containing a number of statements.

3 Result and discussion

3.1 Lecturer Education

The results show that 3 lecturers have a doctoral degree in natural science education (42%) And as many as 4 lecturers have a Master degree in the field of natural science education (58%). It can be seen in the table below.

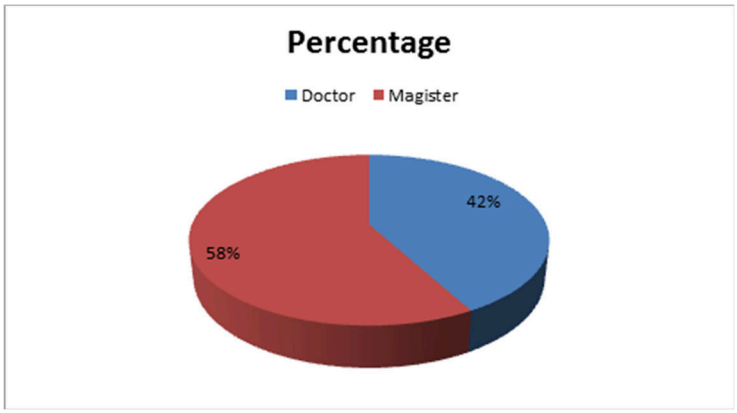

Fig. 1. Education level of lecturers in natural science education

This proves that the lecturers of natural science education have been in accordance with their expertise. A good lecturer is a lecturer who is able to teach the science based on the expertise in order to students are able to understand the learning thoroughly [24]. The lecturers' expertise will facilitate students to solve problems in the learning process. The problems that arise in the learning process do not always conform to the learning plan, therefore it is required lecturers who are able to understand their expertise thoroughly. A good lecturer is a lecturer who comprehend his expertise so that he/she is able to help students to be success [25].

3.2 Employment Period

Other observations states that as many as 5 lecturers have employment period of 31-40 years (71%) While the remaining 2 lectures have employment period of 0-10 years. This

proves that most lecturers have long employment period. A Lecture who have long employment period will have high pedagogic competence that can help students to overcome several problems [26].

3.3 Learning Design

In terms of drafting a learning plan or a unit of learning , all lecturers do preparation a study plan in conducting learning activities. A total of 100% of lecturers state that they draft the learning plan. In the preparation of the Learning Plan there are some components that have been set by the university so that the lecturers have the same components. The components in the preparation of the Learning Plan are identity, the expected ability, material, activity stage, lecture activities, student activities, assessment techniques, assessment and media sections. The preparation of a learning plan will be able to improve learning quality [27] [28]. The Learning Plan aims to allow lecturers to run the learning process with the instructions that have been created before. This learning plan needs.

3.4 Learning Materials

In terms of learning materials. Learning materials are a learning resource for students. Based on the poll that all the lecturers make choose journals, books and dictates as the main learning source. 14.3% of lecturers use the visual audio and 85.7% of lecturers use Internet and computers

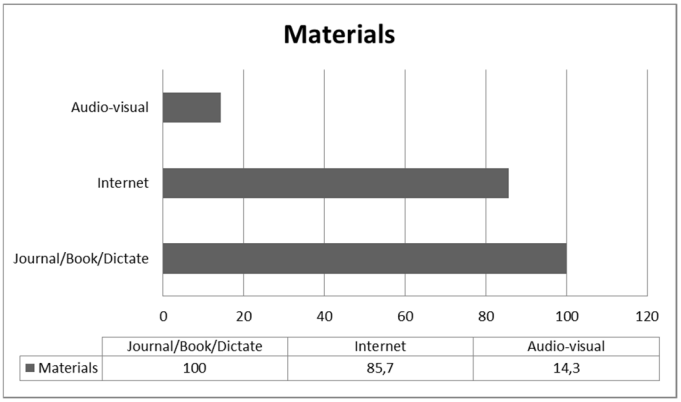

Fig. 2. Graph of Learning material

In the table above, it can be seen that many lecturers use journals, book, dictate, and Internet as learning resource. This is in accordance with the need of the current learning that the learning Resource should be a reference for the students in finding information. Books and journals are one of the learning resources that can improve the learning outcomes of students. This is due to books and journals are based on thoughts and research that have been tested by the truth by authors/writers of books and journals [30]. In addition, Internet is also a suitable learning resource in the learning process [31]. The learning resource is everything that can help someone in learning [32]. In other words, the learning Resource is an important part that should be known by lecturers and students in order to be used as reference to find problems.

3.5 Ecoliteration Learning Knowledge

Ecoliteration Learning in the basic concept of natural science education. In the relation to the ecoliteration learning in the basic concept of natural science education Some lecturers have not performed the basic concepts of natural science education related to ecoliteration. A total of 85.72% of lecturers state that they do not give ecoliteration material in the basic concept of natural science education. It can be seen in the table below.

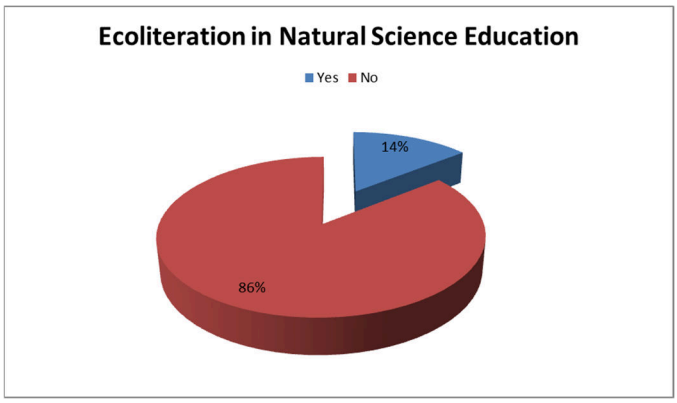

Fig. 3. Ecoliteration in natural science education

The table above proves that lecturers have not given and developed the students' ecoliteration ability in learning basic concepts of natural science education. The basic concept of natural science education consists of the material size and unit, light, style, wave and sound, motion, simple plane, temperature and heat. The material is very related to ecoliteration. Then it can be concluded that the lecturers have not given ecoliteration material in learning the basic concept of natural science education. Ecoliteration is necessary to be taught to students because ecoliteration can increase spirit and action of student to face environmental issues [33] [34]. Ecoliteration needs to be developed in college learning in order to students are aware of the need for environmental rescue for sustainable living.

3.6 Supporting Facility

Supporting facility. A total of 100% of lecturers have mobile phone as primary tool of communication. However, based on the observation the mobile phone is not used as a tool of learning. A total of 100% of lecturers have laptop. This laptop ownership is a good step in the mobile learning process. A total of 100% of lecturers have printer, 100% of lecturers have scanner and as many as 85.71% of lectures have tablet. For more details can be seen in the table below

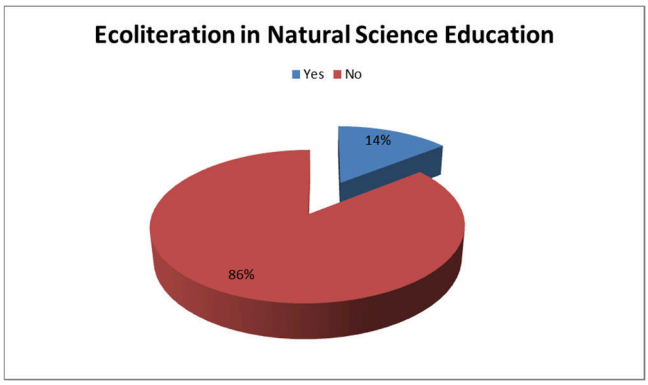

Fig. 4. Graph of supporting facility of lect

In addition, based on the distribution of polls to students it appears that as many as 100% of students have smartphone, 95% of students have laptop, 87% of students have printer and 83% of students have scanner. For more details can be seen in the table below.

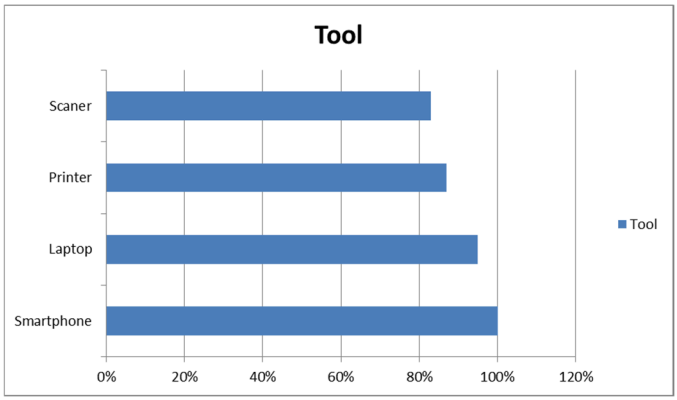

Fig. 5. Graph of supporting facility of stdents

Based on the table above, it can be seen that the average lecturers and students have complete personal learning support tools such as handphone, tablet, laptop, printer, and scanner. It is the foundation for the development of e-learning process. E-learning process is required tools that can access Internet networks such as smartphone or laptop [35] [36]. In e-learning process, it needs useful Internet access as a means of finding information in the learning process. Internet network will be a mediator for lecturers and students

3.7 Computer Skills

Computer skills. In the process of learning using the blended learning system is required computer skill for lectures and students to operate computer. This computer operation includes the ability to plan, implement, and evaluate learning to be more active, efficient and interesting. Based on the distribution of polls, it can be found that as many as 100% of lecturers can operate Microsoft Word, 85.71% of lecturers can operate Microsoft Excel, 85.71% of lectures can operate Microsoft Office Power Point, 57% of lecturers can operate

Mind Manager application, and 57% of lectures can operate multi interactive media. Based on the result above, it can be concluded that the lecturers in general already have been able to operate the applications on the computer.

While for students, as much as 98% of students can operate Microsoft Word, 77% of students can operate Microsoft Excel, 88% of students can operate Microsoft Office Power Point, 45% of students can operate Mind Manager application, and 35% of students can operate multi media. Based on the result, it can be concluded most students already have computer skills [38]. The computer skills should be a part of the students. The era of revolution of industry 4.0 demands the students do not only operate the computer but the students are required to create applications that make it easier for people to finish their work.

3.8 Understanding of the Blended Learning

Understanding of the blended learning. Based on the distribution of poll to the lecturers, as many as 100% of lecturers have been listening to the term of blended learning but they never carry out the blended learning. While based on the distribution of poll to the students, as many as 23% of students who have heard the term of blended learning and no one students have ever studied through the blended learning model. This proves that there is no the blended learning process in learning. The blended Learning is a learning that uses technology media and direct learning [38}. The blended learning has several advantages such as:

a. Increase motivation and student learning achievement [39].
b. Improve reasoning and mastery of the student concept [40].
c. Develop student learning skills [41].
d. Improve student performance [42].

3.9 The Need of the Blended Learning Development

The need of the blended learning development. The blended learning is a future learning that is suitable with of the revolution of industry 4.0. The blended learning as a learning that combines technology, learning process, and type of traditional learning process [43]. Therefore, the need of the blended learning development in the era of Revolution of Industry 4.0 aims to improve students' ecoliteration ability. Based on the poll, a total of 100% lecturers agree to develop the blended learning in the effort to improve students' ecoliteration ability. As much as 94% of students agree to learn the the blended learning and the rest students disagree because they have not been sure that they will be able to learn the blended learning. This proves that lecturers and students agree with the blended learning process. The blended learning is a learning in compliance with the Revolution of industry 4.0 [44]. This is due to the blended learning combines technology media with traditional media so that students can lead to change in the transition period of traditional learning to modern learning.

Therefore, overall it can be concluded that it is necessary to have the blended learning in the effort to improve student's ecoliteration ability.

4 Conclusion

Overall it can be seen that there is a great opportunity in developing the blended learning in the effort to improve student's ecoliteration ability. The foundation of the development can

be seen from the excellent education level of the lecturers, the employment period of the lecturers, availability the good learning plan, knowledge of good teaching materials, no effort in developing students ecoliteration ability and lecturers and students have complete supporting facilities, computer skills lecturers and students' in computer skill, the weakness of students' knowledge about the blended learning and the high desire of lecturers and students in developing the blended learning in the effort to improve students' ecoliteration ability.

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