THE BLENDED LEARNING ACCOMPLISHMENT
OF COMPUTER AND NETWORK ENGINEERING EXPERTISE PROGRAM
IN VOCATIONAL SCHOOLS

Aries Alfian Prasetyo, **Setiadi Cahyono Putro**, **I Made Wirawan**
Department of Electrical Engineering, Faculty of Engineering, Malang State University
Email: aries.alfian@gmail.com

ABSTRACT

This study aims to (1) describe supporting and inhibiting factors in blended learning implementation for the students of computer and network engineering expertise program and (2) describe the accomplishment level of the implementation. This study is designed as a descriptive study with quantitative approach. The research object is the blended learning implementation in computer and network engineering expertise program in SMK N 1 Baureno Bojonegoro. The research subjects consist of teachers, facilities, materials and applications and students in the blended learning implementation process. The data was collected using observation, surveys and interviews. It was analyzed using percentages and classification analysis. The results reveals that the blended learning has been appropriately implemented. It is proven by the analysis result of supporting and inhibiting factors including facilities, teachers' skill, materials and applications and blended learning accomplishment. The result is also supported by the description about blended learning activity, the use of facilities, blended learning composition and the impact of implementing blended learning. The weaknesses in the implementation process are the low quantity and quality of personal computers and inadequate internet connection. Teachers and school boards are expected to work collaboratively to solve the problems thus the implementation of blended learning can be maximized.

Keywords: blended learning, computer and network engineering, facilities, material application, teacher's skill

INTRODUCTION

The development of communication and information technology has contributed to educational fields. By employing communication and information technology, teachers conveniently access the information to support learning activities. It is ranged from teaching methods, learning media and new learning resources to create interesting learning activities so that the students are highly motivated to focus on learning activities.

Recently, internet is one of the media which contributes in communication and information technology in Indonesia. Internet helps people to get information and communicate easily and fast. The government and educational institutions have started to implement a learning system facilitated by internet connection for society who has limitation in time and distance to access information especially the information in the educational field. Therefore in the future it is expected that time and distance will not be the problem anymore for developing education. One of the methods which starts to implement this system is distance learning. The distance learning method is an alternative method to give quality in education distribution. This system is expected to be able to solve some problems caused by the limited number of qualified instructors (Dede, 2011).

The distance learning method helps students or society in learning new things or knowledge with more interesting package and easier to understand. In accessing and using this method, internet contribution is obviously required because through internet people can sending and receiving files. Therefore by using internet, teachers and students, can connect each other to communicate and share the information though they are in different places.

However, every method has strengths and weaknesses. The distance learning method facilitates people to conduct learning process without limitations of time and space. Sending or uploading files to be published and access the intended files in the learning process may be conducted easily by using internet. In the other hand, blended learning also shows its weakness. When a teacher and students are in different places, there is high possibility for distraction so that the learning process depends so much on each learner's motivation. Based on its weakness, the distance learning implementation method which brings the idea of learning from far distance using internet as its media is still not applicable since principally teachers in the learning activity should meet their students face-to-face in order to grow students' motivation to learn and have understanding.

From the fact that distance learning is not effective because teachers and students cannot meet face-to-face to keep students' motivation, there is a new method that is blended learning. Dwiyogo (2010) pointed out that blended learning is a learning which combines strategy and learning delivery strategy using face-to-face activity, computer based learning (offline) and online computer based (internet and mobile) learning. This is one of revolution in the internet based educational field which can be used to implement distance learning and also supporting learning. In its implementation, though both parties use internet, blended learning does not require learning to be only online centered but also it is combined with the face-to-face method so that the learning process will be supervised and controlled. For instance when students face difficulties in understanding online learning, they can get the explanation in the next morning by asking their teacher directly at the school. This condition can keep students' motivation so that teachers' roles as the supervisor and the manager of education still run effectively. The students and the teachers (facilitators) cooperate in improving learning quality in order to make learning process to be more interesting and easily understood by the learners.

Dwiyogo (2010) stated that the main objective of blended learning is to give opportunities for students with various characteristics in order to make long life autonomous, continuous and developing learning so that learning will be more effective, efficient and interesting. In implementing blended learning, there are three main factors: (1) facilities, (2) teachers who need to improve their competence in computer skills by reading and self-training or by joining formal training and (3) students who need to get access to the computer and internet and also having capability in employing E-learning (Kusairi, 2011). In order to get optimum learning, those three factors should be fulfilled and implemented. The school boards and the educational institutions are required to complete all facilities, to support teachers in developing their competence in computer skills and to help students to get computer and internet access. If the factors are completed, the blended learning implementation will be optimum.

In implementing blended learning, the educational institutions seem to have difficulties in differ between distance and blended learning. Blended learning with a full online strategy is same with distance learning where the roles of the teachers are not effective. The difference between distance and blended learning is in its proper composition in managing online, offline and face-to-face strategies. The composition distribution is absolutely conducted by the teachers in order to achieve learning objectives. Therefore, the study on how blended learning implementation process and how to optimize blended learning in order to run effectively and efficiently is crucial.

METHODS

This study is designed as a descriptive quantitative study. The variable which becomes

research object is the implementation of blended learning. The students are involved as informants in revealing blended learning implementation. The informants consist of 2 students from each class who are academically prominent based on teachers' record or the member of the student boards in the class. The total of informants is 4.

The research instruments consist of (a) facilities, (b) teachers' skill and (c) materials and applications. The facilities include internet connection type, PC, LCD projector, projector screen and sound system. Teachers' skill according to Kusni (2010) is teachers' competence in blended learning which are (1) teachers need to have skill in conducting E-learning, (2) teachers need to prepare digital references which can be used by students, (3) teachers need to plan the references which are suitable or integrated with face-to-face learning and (4) teachers need to allocate time to manage internet learning based such as developing material, instrument, assessment and answering various questions asked by the students.

Data collection was conducted to reveal the facility factors and it was done by observation. Then, the data of teachers' skill including how teachers' skill in managing and implementing blended learning would be revealed. To get the valid data, the related teachers are interviewed. While, to reveal the type of material and application prepared by the teachers to implement blended learning, the questionnaire was administrated. To gain the data of the accomplishment of the study, the students were interviewed. The students explained about how teachers implemented blended learning by employing facilities and also materials and applications prepared, so that the data collected was valid. The analysis to process the data per item refers to Sudijono (2011: 43) presented in the following equation.

$$P = \frac{F}{N} \times 100\% \qquad (1)$$

Where P, F, and N are result scoring percentage, obtained score, and total score respectively. Equation 1 is used to analyze the data which includes (1) facilities, (2) teachers' skill, (3) material and application and (4) blended learning implementation process. From the blended learning implementation data result, it will be compared with the facilities data result, teachers' skill and material and application. To know the possibility level of blended learning accomplishment, it is calculated using Equation 2.

$$BL = \frac{A+B+C+D}{N} \qquad (2)$$

Where BL, A, and B are blended learning accomplishment Facilities and Teacher's skill. Futhermore C, D and N are material and application, learning implementation and total item respectively. After analyzing the data using Equation 1 and Equation 2 to calculate the total item, every score of facilities, teachers' skill, materials and application and blended learning implementation were classified into categories using the category level in Table 1.

Table1. Category Level

Interval	Category
85% - 100%	Very Good
70% - 84.99%	Good
60% - 69.99%	Moderate
50% - 59.99%	Poor
0% - 49.99%	Very Poor

Source: Sudjiono (2011)

RESULTS AND DISCUSSION

The facilities in SMK N 1 Baureno Bojonegoro in supporting blended learning in computer and network engineering expertise program are presented in Table 2.

Table 2.Facilities Result Analysis

Facilities	Number of Facilities	Maximum Score
Internet Connection Type	5	1
Personal Computer	20	0
LCD Projector	1	1
Screen Projektor	1	1
Sound System	1	1
Total Maximum		80

According to the data presented in Table 2, the availability level of facilities is on interval 70% - 84, 99%. The score shows that the availability level of facilities in SMK N 1 Baureno Bojonegoro to support blended learning in computer and network engineering expertise program is categorized into good level. The result of teachers' skill is presented in Table 3.

Table 3.Teachers' Skill

No	Name	Position	Score
1	Teacher 1	Head of Competence of Expertise/ Computer and Network Engineering Teacher	100%
2	Teacher 2	Computer and Network Engineering Teacher	91%
3	Teacher 3	Computer and Network Engineering Teacher	91%
		Average	94%

The average calculation of teachers' skill is 94%. It can be analyzed the teachers' skill level. The average score of 94% shows that it is categorized into very good. The scores of materials and application are presented in Table 4. The average percentage is 83% and it is categorized into good.

Table 4. Material and Application Availaibility

No	Name	Position	Score
1	Teacher 1	Head of Competence of Expertise/ Computer and Network Engineering Teacher	73%
2	Teacher 2	Computer and Network Engineering Teacher	100%
3	Teacher 3	Computer and Network Engineering Teacher	78%
		Average	83%

Based on closed interviews with students about implementation of blended learning to the students, it is known that the implementation of blended learning is 84%. The detailed data is presented in Table 5.

Table. 5 Blended Learning Accomplishment

No	Name	Position	Score
1	Student 1	Student/ XI Computer and Network Engineering 2	75%
2	Student 2	Student/ XI Computer and Network Engineering 2	75%
3	Student 3	Student/ XI Computer and Network Engineering 1	100%
4	Student 3	Student/ XI Computer and Network Engineering 1	87,5%
		Average	84%

Based on the result, the facilities availability has 80 points, the percentages of teachers' skill, material and application, and the students' scoring through closed interview

about blended learning implementation were 95%, 83% and 84% respectively. From those data, it is obtained that the study of blended learning implementation in computer and network engineering expertise program in Grade XI SMK N 1 Baureno is 85%. Based on the reference table, it can be concluded that the blended learning accomplishment has been implemented appropriately because the result is in the range score of 85% to 100%.

Of the five facility factor items, four items were completely fulfilled but one item is still becomes obstacle in implementing blended learning. This obstacle is inadequate personal computers. This means blended learning implementation is not completely supported by the facilities. In its implementation, blended learning needs adequate organizational preparation and technical source (Tabor, 2007). If one of the items is not provided then blended learning will not be implemented optimally. The teachers' skill become the supporting factors to implement blended learning. Kusni (2010) suggested that in implementing blended learning, teachers' aspects including the skill in conducting E-learning and or integrated face-to-face learning. The skills are very essential because teachers as implementers and persons in charge of learning should implement blended learning effectively so that they can manage face-to-face learning.

Based on the findings, teachers have completely prepared and managed materials and applications between online and offline face-to-face learning. Kusni (2010) stated that teachers should prepare digital references which can be referred by the students. With teachers' ability in preparing materials and applications then the blended learning implementation can be maximized. With the availability of various materials supported with application, students have more learning resources and the students can interact with teachers or among other students outside the school hours by using prepared and managed applications by teachers.

Therefore, learning will be more interesting and it can explore students' competence optimally. Blended learning composition, how many portions of face-to-face learning, online and offline learning may be varied. It is caused by different teaching styles of every teacher. Besides, it also depends on the targeted competence analysis, subject's goals, learner characteristics, face-to-face interactions, online or combination learning strategies, learner's location, teacher's competence and characteristic and available resources.

The consideration to organize the blended learning composition to be 50/50, 75/25 or 25/75 depends on targeted competence analysis, subject's goal, learner characteristic, face-to-face interaction, online or combination learning strategies, learner's location, teacher's competence and characteristic and available resources (Dwiyogo: 2010). Based on cross analysis toward those considerations, teachers will be able to decide the most suitable learning composition (percentage). Nevertheless, the main consideration in planning learning composition is providing the learning resources which is suitable for various learners' characteristics in order to learn more effective, efficient and interesting.

The recognizable impact from blended learning that had been conducted are (1) the students are more enthusiastic with blended learning because the learning process becomes more interesting and not monotonous, (2) by implementing blended learning, teachers can observe students' activities out of school hours and (3) the students can explore other learning resources besides in classes. It is in compliance with Dwiyogo's statement (2010), that blended learning is the best choice to improve effectiveness, efficiency and attractiveness in humans' interaction in various learning environment. Blended learning offers opportunities to learn in groups and to learn individually, as well as in the same or in different time.

CONCLUSION

The blended learning accomplishment in the computer and network engineering expertise program in SMK N 1 Baureno Bojonegoro has been appropriately implemented. It is proven by the analysis results of supporting and inhibiting factors including facilities, teachers' skill, materials and applications. It is also supported by the result of the implementation blended learning which compares the analysis of supporting and inhibiting factors with the process of the implementation. The description about blended learning activity, the use of facilities, the composition of blended learning and the impact of implementing blended learning were also analyzed to draw the conclusion that blended learning has been appropriately implemented. Though blended learning has some strengths, but there are weaknesses in implementing blended learning. There are some deficient facilities such as low quantity of personal computers and slow internet connection. Both teachers and school boards are expected to coordinate and work collaboratively to solve this problem so that the implementation of blended learning can be maximized. The findings revealed that blended learning is able to create interesting and interactive learning for the students. It helps the teachers to interact with the students in delivering materials. This result should encourage school boards or other educational institutions to study and implement blended learning.

REFERENCES

Dede, Yahya. 2011. *Perkembangan TIK di Bidang Pendidikan.* Accessed on 26 December 2013 at http://dedeyahya. com/2011/10/perkembangan-tik-dibida ngpendidikan.html

Dwiyogo, W.D. 2010. *Pembelajaran Blended Learning*. Accessed on 13 March 2013 at http://id.wikibooks.org/wiki/Pembelajara nBerbasisBlendedLearning

Kusairi, Sentot. 2011. *Implementasi Blended Learning.* National Seminar on the Development of Blended Learning. The Department of Biology, Faculty of Science, Malang University. Malang, 10 January 2012

Kusni, M. 2010. *Implementasi Sistem Pembelajaran Blended Learning pada Mata kuliah AE3121 Getaran Mekanik di Program Aeronotika dan Astonotika*, Seminar Tahunan Teknik Mesin

Sudijono, Anas. 2011. *Pengantar Statistik Pendidikan*. Jakarta: PT. Raja Garfindo Persada

Tabor, S. 2007. Narrowing the Distance: Implementing A Hybrid Learning Model for Information Security Education. *The Quarterly Review of Distance Education*, 8, 1. 47-57