THE DEVELOPMENT OF BLENDED LEARNING BASED ON HANDPHONE FOR COMPUTER SYSTEM SUBJECT ON XI GRADE OF SMKN 1 BENGKULU CITY

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Abstract

Purpose of Study: Education has an important role to improve the quality of human resources that made the younger generations could develop their potential optimally. Vocational High School (SMK) is one of the educational institutions that has prepared their graduates to enter the working world. One of the compulsory programs in Vocational High School is the students were carried out on the fieldwork practices (PKL). To provide learning access for students as long as they stayed in the industry area, so it was necessary to give learning on blended learning by using handphone as a learning media. In order to get students' learning outcomes be maximized, so the development of this learning should be done by applying Research and Development patterns that were adapted from The Steps of System Approach Model of Educational Research and Development (R & D), Fourth Edition and Seventh Edition by Borg and Gall. Blended learning models that would be developed are Norman Vaughan and Flipped Classroom Models. Learning materials were developed are computer system subject. The measurement of result development was done by the formative evaluation that consisted of one to one evaluation with expert, one to one evaluation with learner, small group and field trial.

Methodology: The methodology that was conducted is stages of learning model adopted from Model of The Steps of System Approach Model of Educational Reseach and Development (R & D), Fourth Edition and Seventh Edition by Borg and Gall. The blended learning model that will be developed is the Norman Vaughan model and Flipped Classroom Model. (Helena Gillespie et.all, 2007)

Results: Stages of learning model development that was adopted from Model of The Steps of System Approach Model of Educational Reseach and Development (R & D), Fourth Edition and Seventh Edition by Borg and Gall. The blended Vaughan model and Flipped Classroom Model. Stages of development process as follows:1) Data and Information Collecting, 2) Identity Instructional Goal, 3) Conduct instructional Analyze, 4) Analyze Learners and Contexts, 5) Write Performance Objectives, 6) Develop AssessmentInstrument, 7) Develop Instructional Strategy, 8 Develop and Select Instructional Materials, 9) Revise Instruction, 10) Design and Conduct Formative Evaluation of Instruction (Gall et all).

Implications/Applications: Development of blended learning based on handphone was appropriate to be used in learning at XI grade of SMK. It was caused that students of XI grade have followed the practice of field work for about 3 months, as long as the students followed the practice of fieldwork, it meant that the learning process was still being applied by using handphone media and learning outcomes showed that there was an improvement in learning outcomes.

Keywords: Blended Learning, Handphone, Computer System Subject, Research, and Development.

INTRODUCTION

Education has an important role to improve the quality of human resources that appropriate with the objectives of National Education, it was developing of the quality of human resources, directed, integrated and comprehensive through various of productive and creative efforts by all components of nation, so it could make young people able to develop their potential optimally.

To produce qualified human resources could be done by formal education, nonformal education, and informal education. Formal education is education that is held in schools through teaching-learning process, tiered and sustainable that starting from basic education, secondary education to higher education. Non-formal education is an educational way which is outside from formal education that can be implemented by tiered and structurally. Informal education is an educational way of family and environment.

The quality of Human Resources (HR) would be the key to winning the competition of MEAera. Without the effort to improve the quality of human resources quickly, Indonesia would not be able to compete with foreign job seekers who

enter the country. An overview of job seekers from education institutions in Indonesia until the end of 2014 as shown in figure 1.

The high number of job seekers was an opportunity to take a role in the era of MEA 2015 if the human resources have a good competence which was appropriate with their field. The competence could be obtained on the educational process at various levels of education.

In order to improve the role of SMK in the global market competition and to prepare skilled middle-level workers, the implementation of SMK needed more enhanced students' participation in learning. The learning process in SMK needed to apply innovative and productive learning to make students can develop their competencies that was facilitated by teachers. For this purpose, it has been required on the curriculum. Teaching style should be able to influence the development of education because education is a benchmark of learning within the scope of the school. The learning outcomes of various saints in SMK were not satisfied yet for many stakeholders, it was caused by 1) education was less appropriate with necessary and real fact recently (need assessment); 2) methodologies, strategies, and techniques were not appropriate with learning material; 3). Infrastructures were less supporting on the learning process and 4). Students could not learn face to face with the teacher in the classroom, it was caused that they were carrying out the field working practices (PKL). To improve the condition, it was necessary to improve the quality of the learning process and the learning outcomes with new views and findings in various fields, updated learning methodologies, updated and developed by various groups, especially among education, teaching, and learning. Improving the quality of learning in SMK as an effort to minimize unemployment of SMK graduates, could be done by improving facilities and qualities on implementing teaching and learning process at SMK.

The development of blended learning based on handphone has been tested on computer system subject of XIth grade. It was caused by the result of student's learning in the 2013/2014 academic year showed that it was not maximized yet. There were still many students who were not competent yet (under criterion minimum (KKM) = 70) so it was necessary to improve the learning process. For more details could be seen on figure2.teaching and learning. Improving the quality of learning in SMK as an effort to minimize unemployment of SMK graduates, could be done by improving facilities and qualities on implementing teaching and learning process at SMK.
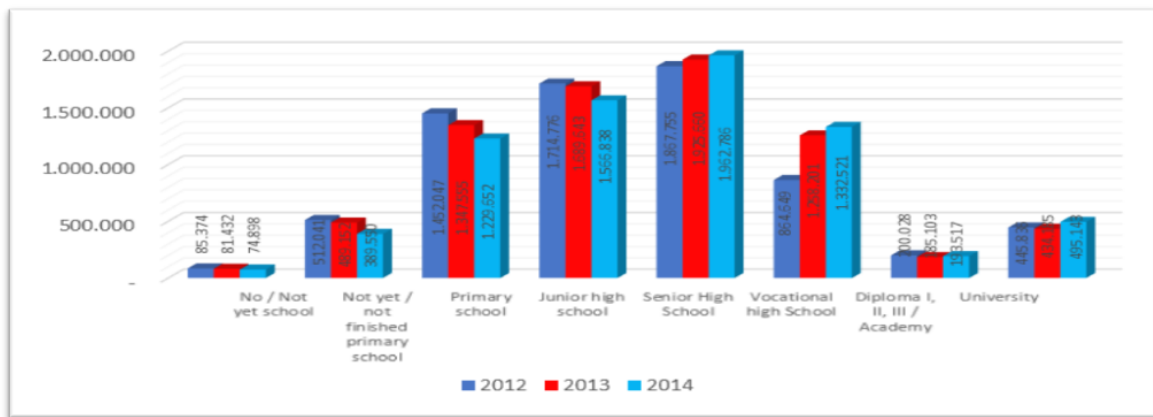

Figure 1. Totally Unemployment Rate by Education in Indonesia in 2012-2014. *Source: www.bps.go.id*
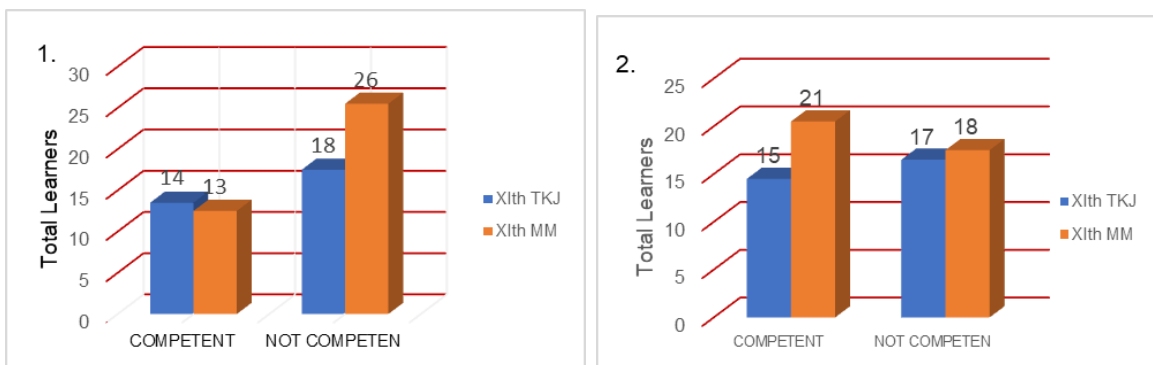

Figure 2. (1) The Result of Computer System Learning Proces First Semester 2013/2014 Academic Years. (2) The Result of Computer System Learning Proces Second Semester 2013/2014 Academic Years

LITERATURE REVIEW

The development of blended learning based on handphone was done by combining learning face-to-face with online learning. Gagne Gagne, Robert. M, Walter W. Wager, Katharine C. Golas, and John M. Keller stated that the term blended learning refers to a training product or program that combines several different delivery methods, such as collaboration software, online courses, electronic performance support systems, and knowledge management practices. (Gagne, Robert. M, Walter W. Wager, Katharine C. Golas and John M. Keller. 2005; Luo et al., 2018)

Thorne stated that "Blended Learning is the most logical and natural of our learning agenda. It suggests an elegant solution to the challenges of tailoring learning and development to the need of individuals".(Thorne, Kaye. 2003; Burgos, Alex Veliz, et al. 2018)

Hew & Cheung explained that "Blended learning as the integration of almost all multiple learning methods or techniques such as a combination of laboratory sessions, face-to-face lectures, assigned readings, formal coursework, self-paced, collaborative, online format, as well as supervised hands-on practice. (Gall, Meredith D, Joyce P. Gall and Walter R. Borg, 2007)

Zorica stated that "...The application is based on blending traditional and mobile educational activities within an e-learning course. A blended course consists of activities adjusted to display on desktop computers (e-activities) and mobile devices (m-activities). An adaptability layer ensures the recognition of devices that are used to access the LMS.2" (Bieslawki, Larry and Davaid Metcalf, 2003)

Allen and Seaman stated that "have defined blended learning as a course with 80% of the content being delivered online, with a blended course being one where 30–79% of the content is delivered online alongside face-to-face sessions".Masie has defined as blended learning user two or more different training methods". (Lever-Deuffy, Judy and McDonald,2011; Safdari et al., 2013)

Implementation of training by using various learning models according to Aora et all need to pay attention to things as like the following: The training program that was developed had three core elements: 1) Blended Learning: presents strategies for integrating face-to-face and online sessions and assignments effectively to impact student learning. 2) Assessing Your Blended Course: engages faculty in writing effective student learning objectives, aligning those objectives with course assignments, and then assessing student learning; outlines mentor process.3). IBIS Course Development Process: outlines the grant project next steps and faculty reporting on progress. (Koc, Selma, Xiongyi Liu, Patrick Wachira, 2015)

In order to give the achievement of learning maximized so the learning process can apply blended learning, according to Aora et all alike as follows: "Blended learning focuses on optimizing achievement of learning objectives were applying by learning technologies personal learning style, the timing of blended learning. Focuses on achieving the learning goals optimally by applying the right learning technology to match the good personal learning style to transfer the right skills to the right person at the right time. (Koc, Selma, Xiongyi Liu, Patrick Wachira, 2015)

A formal education program that gives students learning online as a past in controlling over time. Place, path and/or pace and the other parts by supervising brick and mortar location away from home. (Horn, Michael B. and Heather Staker.2015) Wang, Han, and Yang explained "The content in blended learning, in terms of innovative curriculum design in blended learning Elia, Secundo, Assaf, and Fayyoumi summarized the following new principles "a) the involvement of heterogeneous stakeholders in the course's design phase; b) the focus on development rather than on knowledge transfer; c) the choice of teamwork as an additional to evaluate individual students' performances; d) presence of remote and F2F interactions among peers and between teachers and students; e) the usage of web 2.0 tools as enablers of collaborative learning processes and social networking; f) continuous tutoring both for content and technological issues. (Koc, Selma, Xiongyi Liu, Patrick Wachira, 2015)

Graham, Allen, and Ure in Koc, Liu and Wachira stated that "Reviewed many definitions of blended learning and came up with three common themes: combining instructional modalities or media, combining instructional methods, and combining online and face-to-face instruction. Graham then created the definition: "Blended learning systems combine face-to-face instruction with computer-mediated instruction.
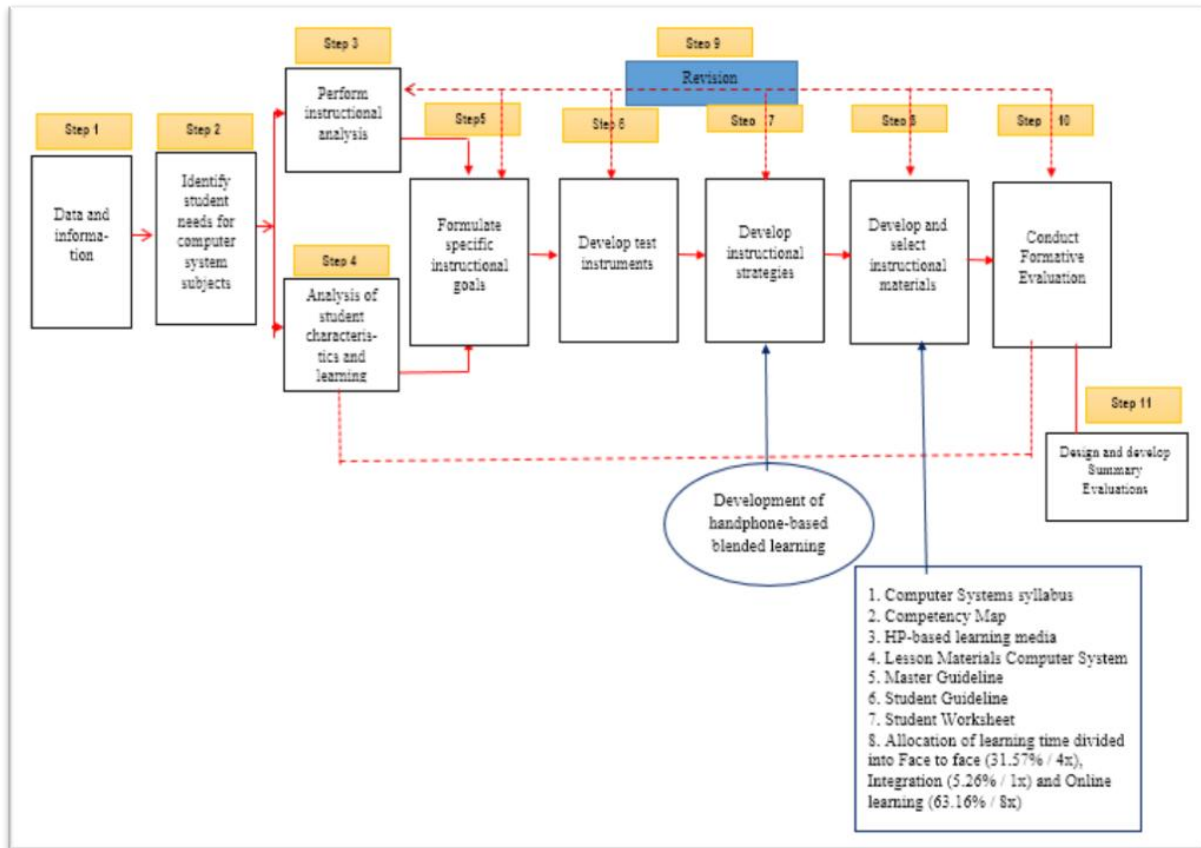
Figure 3. Development of learning at stage 7 by blended learning and stage 8 to develop teaching materials that can be accessed by mobile phones

Handphone as a base of Learning Media. Learning by blended learning can be done by mixing conventional learning with face to face by using various electronic media. In the line with Hogan In Kitchenham stated that: "Refers to use of the use of wireless devices to make online learning even more anytime anyplace. Devices include laptops, MP3 players, iPods, personal digital assistants (PDAs), eBook readers, and smart phonesHogan further explained the scope of blended learning include:1) Dynamics and Access: What is the frequency of use of computer technology necessary for success in the course?; 2) Assessment: How much of the assessment is done via computer technology?; 3) Communication: How much of the communication happens via computer technology? 4) Content: How much of the content is available via computer technology. (Kitchenham, Andrew. 2011)

Thorne explained"Blended learning is a mix of 1) Multimedia technology; 2) CD ROM video streaming; 3) Virtual classrooms; 4) Voicemail, email, and conference calls; 5) Online text animation and video streaming. Blended learnings a mixture of 1). Multimedia Technology; 2) CD ROM Streaming video, 3) Virtual classroom; 4) Voicemail, email and conference calls; 5) online text animation and video streaming. (Suyono and Hariyanto, 2013)

As described above, Blended Learning is learning that combines face-to-face learning and online learning using handphone, then the implementation of blended learning in it there is a form of interaction between teachers and students conducted in combination between the learning Implemented face to face or online. Conventional learning is done in a simple format. Learning is done in the form of direct face to face between teachers and students in the classroom. Learning takes place during a certain time scheduled so that the learning between students and teachers to be relatively limited that learning is done for 2 x 45 minutes for one (1) meeting.

Boss & Krauss stated"mobile phone is turning into multifunctional gadgets, and even those billed as just phone ofter useful learning function. Most of today's phone let you talk, photograph, do text messaging, and browse the internet from almost anywhere".(Boss, Suzie and Jane Krauss, 2007) Associated with the implementation of learning, learning can be done anywhere with the help of mobile phones (in Indonesia called HP and the international term mobile phone (MP) then called the mobile learning (m-learning). If someone learns to interact with the e-learning environment such as chatting aimed at learning then called blended learning. (Kitchenham, Andrew. 2011)

To integrate mobile educational activities into Moodle, mobile quiz apps have been developed. This app allows recognition of the devices used to access the system and adaptation of educational content with respect to the technical characteristics of the device, especially screen size. This application is based on mixing traditional and mobile education activities in e-learning courses. A mixed course consists of activities tailored to a desktop computer display (e-activity) and mobile device (m-activity). (Bodanovic, Zorica, 2014; Muhina, Aboimova, Kulagina, Trophimov, & Chigarov, (2016))

The adaptation layer ensures the recognition of the device used to access the LMS. The process for applying to moodle for learning can be done in steps: 1) Download Easy PHP and Moodle; 2) Install Easy PHP; 3) Set up the MySQL database; 4) install Moodle. (Helena Gillespie et.all, 2007) Juddy, Lever-Deuffy, and McDonald states "When implementing technology in today's schools, one must consider how technologies are likely to change and emerge in the coming years".(Wang, Yuping, Xibin Han, and Juan Yang, 2015) Today's purchase is most wisely made when they are likely to be compatible with the technologies that will be available tomorrow. Wagner in Januszewski, Alan, and Molenda stated "...mobile learning represents the next step in a long tradition of technology-mediated learning. It will feature new l strategies, practices, tools, applications, and resources to realize the promise of ubiquitous, pervasive, personal, and connected learning".(Januszewki, Alan and Michael Molenda, 2008; Akbari et al., 2013)
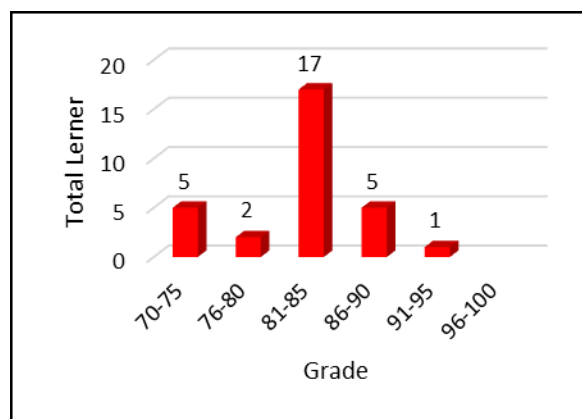

Figure 4. Learning outcomes show that the average student who scored 80 until 100 was 77%.

RESEARCH METHODS

The methodology that was conducted is stages of learning model adopted from Model of The Steps of System Approach Model of Educational Reseach and Development (R & D), Fourth Edition and Seventh Edition by Borg and Gall. The blended learning model that will be developed is the Norman Vaughan model and Flipped Classroom Model. (Helena Gillespie et.all, 2007)

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RESULTS AND DISCUSSION

Stages of learning model development that was adopted from the Model of The Steps of System Approach Model of Educational Reseach and Development (R & D), Fourth Edition and Seventh Edition by Borg and Gall. The blended Vaughan model and Flipped Classroom Model. Stages of development process as follows:1) Data and Information Collecting, 2) Identity Instructional Goal, 3) Conduct instructional Analyze, 4) Analyze Learners and Contexts, 5) Write Performance Objectives, 6) Develop AssessmentInstrument, 7) Develop Instructional Strategy, 8 Develop and Select Instructional Materials, 9) Revise Instruction, 10) Design and Conduct Formative Evaluation of Instruction (Gall et all). A learning model that will be developed is Norman Blended learning process is done by dividing the learning time allocation used 31.57% (4) face to face, 5.26 (1) integration and 63.16% (8) online. The learning outcomes show an improvement from initial learning conditions such as figure3. The results of the application of this model as shown in Figure 4.

CONCLUSIONS

Development of blended learning based on handphone was appropriate to be used in learning at XI grade of SMK. It was caused that students of XI grade has followed the practice of field work for about 3 months, as long as the students followed the practice of field work, it meant that the learning process was still being applied by using handphone media and learning outcomes showed that there was an improvement in learning outcomes.

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