

Dewi_etal_2018_CP

by Priyanto Priyanto

Submission date: 19-May-2020 01:44PM (UTC+0700)

Submission ID: 1327581257

File name: Dewi_etal_2018_CP.pdf (538.88K)

Word count: 6912

Character count: 40534

STUDY OF INSTRUCTIONAL MODEL ON BLENDED LEARNING IN POLYTECHNIC

¹ **Kadek Cahya Dewi^(1*), Putu Indah Ciptayani⁽²⁾, Herman Dwi Surjono⁽³⁾, and Priyanto⁽⁴⁾**

¹Business Department, Politeknik Negeri Bali

²Electrical Engineering Department, Politeknik Negeri Bali

³Department Of IT Education, Universitas Negeri Yogyakarta

⁴Electronics and Informatics Department, Universitas Negeri Yogyakarta

*e-mail: cahyadewi@pnb.ac.id

Abstract: Polytechnic has characteristic which prioritizes the application of practical aspects supported by appropriate theory. Blended learning can be applied in Polytechnic, but a scheme is needed to formulate the correct instructional model. The study objectives were to examine the type of instructional model on blended learning that suits with Polytechnic. The research was conducted by qualitative descriptive approach by Miles and Huberman through observation, in-depth interview, Focus Group Discussion and literature review. The research validity was done by transferability, confirmability, credibility and dependability test. It can be concluded that the instructional model is appropriately determined by the suitability of educational model, technique and method of learning, and also facilities and infrastructure readiness. The instructional model on Blended Learning in Polytechnic is the Rotation Instructional Model. The study had implications on the learning process in Polytechnic. The lecturers could use the schema to determine the suit instructional model for their courses.

Keywords: *Instructional Model, Blended Learning, Polytechnic, Vocational*

STUDI MODEL INSTRUKSIONAL PADA PEMBELAJARAN KOMBINASI DI POLITEKNIK

Abstrak: Politeknik memiliki ciri khas pendidikan yang mengutamakan penerapan aspek-aspek praktis yang didukung oleh teori yang tepat. Blended learning dapat diterapkan di Politeknik, namun diperlukan sebuah skema untuk merumuskan instructional model yang tepat. Penelitian ini bertujuan untuk mengkaji jenis instructional model pada Blended Learning yang sesuai dengan karakteristik pendidikan Politeknik. Penelitian dilakukan dengan pendekatan deskriptif kualitatif model Miles dan Huberman, teknik pengumpulan data observasi, wawancara, Focus Group Discussion dan kajian pustaka. Keabsahan data dengan uji transferability, confirmability, credibility dan dependability. Penelitian menyimpulkan bahwa instructional model yang tepat ditentukan dengan mempertimbangkan kesesuaian antara model pendidikan yang diselenggarakan, teknik dan metode pembelajaran mata kuliah, serta ketersediaan sarana dan prasarana pembelajaran. Sesuai dengan pertimbangan tersebut maka instructional model pada Blended Learning di Politeknik adalah Rotation Instructional Model. Implikasi penelitian terjadi pada proses pembelajaran di Politeknik. Para dosen dapat memanfaatkan instructional model skema untuk menentukan instructional model yang tepat untuk mata kuliah yang diampu.

Kata Kunci: *Instructional Model, Blended Learning, Politeknik, Vokasi*

INTRODUCTION

Based on National Education System as stated in Indonesia Law no. 20 of 2003 and further reinforced by Indonesia Law no. 12 Year 2012 on Higher Education, Polytechnic is a vocational higher education who can conduct a Diploma education. The different characteristics and orientations between vocational and academic education required the design of

different learning processes and curricula. In vocational/polytechnic education, learning was conducted with a small numbers learners with average 28 students in a class. Therefore the addition of students number should be followed by the addition of learning facilities and infrastructure that would support their skill. It made the learning process was inefficient. As presented by Finch and Crunkilton, that the

ultimate success of vocational education was not only measured by learning achievement, but also on performance that was in line with the real world of work (Finch, 1999). Abie stated that vocational education graduates must have relevant skills supported by the foundations of science, service motives, and able to apply their abilities in various variations of circumstances, and have ethics, morals and values (Abie, 2014).

In line with Abie's opinion, the successful implementation of vocational education was largely determined by students, educators, curriculum and learning support facilities. In vocational education the design of the curriculum should be concerned in the composition between practice and supporting theories appropriately. In vocational education the composition of the practice was more dominant than the theory. Haider argued that there was a difference between theory and practice so that curriculum preparation is not enough done by educators who only had teaching experience but should involve practitioners who are believed to be very aware of the conditions that exist in the working world (Haider, 2016). To meet the needs of the technical personnel of the community, the curriculum must be tailored to the needs of the students.

The overall quality of the educational process was not only depending on the quality of the curriculum, but also on the ability to realize it. The main factor that affecting the quality of the curriculum is the basic elements in the implementation process. The main implementation elements are: (a) adequate conditions; (b) the ability of teachers to convey the objectives and expected outcomes of the curriculum; (c) inform the curriculum structure and its role in the teaching process; (d) preparation of relevant learning materials; (e) ability in managing the learning implementation process; (f) monitoring and evaluation of instructional process realization; and (g) connect with companies and other social partners.

Vocational Curriculum Development Guidance Manual from the Directorate General of Learning and Student Affairs, Ministry of Research, Technology, and Higher Education (KEMENRISTEKDIKTI) stated that for implementing the curriculum in order to fit the expected curriculum documents, every course should complete with Semester Learning Plan

(SLP) documents. SLP is a learning process plan that was prepared for learning activities in one semester to meet the learning achievements that charged to the course. On the implementation, the learning process should refer to the SLP that has been made including when conducted by online learning. SLP should contain the identity of the course, the learning achievement, the expected ability, the study materials, the method, the provided time, the student learning experience, the assessment, and the references. In line with the principles and content of the learning plan, the effectiveness of the learning process was also concerned. The effectiveness of the learning method was become one of the critical success factors. Along with the rapid utilization of ICT in learning process, there was a new concept of learning method. Currently the learning method was not only done conventionally face-to-face but also can be done online and can even be done by combining between face-to-face learning and online known as Blended learning (Hybrid learning) (Ghirardini, 2011). Blended learning is one of the learning methods that can be applied in higher education to improve the quality of learning. Yagci stated that learning supported by online learning methods could have a positive effect on increasing student motivation, and therefore have a positive effect on academic success (Yagci, 2016). Blended learning is well suited for encouraging collaborative and constructive learning that is strongly emphasized in today's learning styles (Wong, Hamzah, Goh, & Yeop, 2016). In Indonesia some universities have already implemented e-learning and the students responded positively to the e-learning (Herayanti, Fuadunnazmi, & Habibi, 2017; Divayana, 2017). While the utilization of ICT in vocational education had not been done optimally, it was still limited to utilization in theory learning course.

Implementation of blended learning in the learning process are found varies according to the discipline being taught, student characteristics and learning outcomes, and has a student-centered approach to learning design (Saliba, Rankine, & Cortez, 2013). There are four models that are generally implemented in blended learning namely Rotation model, Flex model, A La Carte model, and Enriched Virtual model (Brooke, 2015). The four models in their implementation must adapt to the

technology used, time, instructional learning, and effectiveness in improving student skills.

Based on the description, the research question was how the schema to formulate instructional model on blended learning in Polytechnic. Then the study objectives was to examine the instructional model on blended learning that was suitable to be implemented in the learning process in accordance with the characteristics of vocational education. The research was the beginning research of Modelling Vocational Blended Learning in Polytechnic

METHOD

The research was a phenomenology qualitative research. The research was conducted by qualitative descriptive approach. The subject of research was Polytechnic civitas academica, while the object of research was instructional model on blended learning in polytechnic as delivered by Brooke. The research was held from March until August 2017 by observing the learning process at one of the Polytechnic in Indonesia. The technique of data collection was done by observation, in-dept interview, Focus Group Discussion (FGD) and literature review. Respondents at the interview stage were Assistant Director of Academic Affairs, 6 persons of Head of Departments, and 13 persons of Head of Study Program. Respondents at the FGD stage were 45 people that were consisting of Assistant Director of Academic Affairs, the Heads of Department, the Heads of Study Programs and also the lecturers. The key informants were Assistant Director of Academic Affairs and the Heads of Study Program. The literature review was conducted on the Indonesian government's policy on Polytechnic and previous research relevant to the instructional model on learning through blended learning.

The variables studied in this study include four aspects of instructional model blended learning that consisting of Rotation model, Flex model, A La Carte model, and Enriched Virtual model. The data analysis used was descriptive qualitative analysis as delivered by Miles and Huberman. The analysis yield description about instructional model from the relevant blended learning as an effective model in achieving the learning objectives in polytechnic. As Miles and Huberman qualitative analysis, the research divided into three activities namely data reduction,

data display and conclusion. The research started from studying the problems of education in Indonesia until formulated instructional model which is appropriately applied to polytechnic higher education. The steps taken in this research namely:

1. Study of education problem in Indonesia
2. Study of vocational education paradigm
3. Study of ICT utilization in vocational education
4. Study of Instructional Model on Blended Learning in Polytechnic
5. Formulation of instructional model determination scheme that described in Discussion part of this paper.

The research validity was done by transferability, confirmability, credibility test and also dependability test. The credibility test was conducted by triangulation model that assessed the data with some different technics such as observation, in-dept interview, and also FGD. The dependability test was done by audit from the experts.

Research design with the framework as shown in Figure 1.

FINDINGS AND DISCUSSION

Findings Education Problem in Indonesia

Based on interview with Assistant Director of Academic Affairs, it was found that the meaning of globalization implies the integration of national life into global life. When linked in the field of education, globalization of education means the integration of national education into world education. The problem of globalization in education concerns to the output of education. In today's global era, the superiority of a country is no longer measured by comparative advantage that focuses on the potential of natural resources, but on the competitive advantage that is based on the possession of qualified human resources (HR). Based on the report of The Global Competitiveness Index 2017-2018 released by World Economic Forum, Indonesia is ranked 36 out of 137 countries, while for the competitiveness of higher education is still ranked 64th.

In building quality human resources as a competitive advantage, the role of education becomes very important. It needs to make changes in the paradigm of education as to provide significant changes in the pattern of learning that can empower the learners to be more

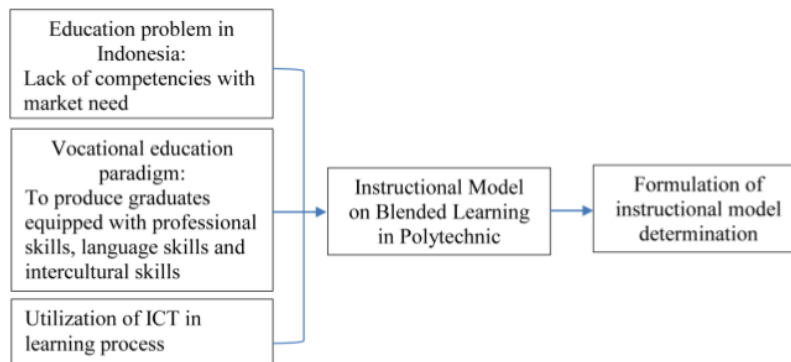


Figure 1. Research Framework

independent. An appropriate learning strategy developed today is student centered learning (SCL) by adopting the development of IT in learning (ICT). Utilization of ICT is able to create various learning media that is effective in transfer knowledge. In line with Suyanto's opinion that learning is no longer using a single media, takes place in isolation, teacher-student interaction in the form of information and teaching based on factual or knowledge (Suyanto, 2006).

Another problem faced by higher education in Indonesia, especially in vocational education is the low quality of graduates. This was found when interviewing the heads of departments and the heads of the study program. They got input from the external stakeholders like industry or graduate users. There were several factors of that problem, among others: unclear learning outcome, organizational issues, transparency and accountability, the design of learning in the form of curriculum documents that are not inline with the needs of industry, low ability and skills of academic and non-academic human resources, low quantity and quality of learning facilities and infrastructure. It was very worrying, because the graduates of vocational colleges that was expected to meet the needs of skilled workers for the industry was not achieved as expected. Actually, the graduates of vocational education contributed the increase of educated unemployment rate in Indonesia.

According to the Institute for Policy Research and Development study Indonesian Education Region V (2017), the availability of facilities and infrastructure of adequate learning facilities as a key element in realizing the quality of higher education. Beside that Kartikasari's research also described that learning facilities

and infrastructure as physical evidence was one of the main factors in the selection of universities (Kartikasari, Sinarti, Hidayat, & Irsutami, 2014). From the results of the study with the limited facilities owned by vocational colleges, it required the innovation in the learning process in order to run effectively and efficiently. One alternative that can be taken into consideration is by designing ICT-based learning process. As mentioned by Yagci, that online learning methods could have a positive effect on increasing student motivation, and therefore have a positive effect on academic success (Yagci, 2016).

Vocational Education Paradigm

Based on literature review, it was found in the explanation of pasal 16 ayat 1 Indonesia Law No.12 of 2012 about Higher Education that vocational education was education that prepares students to have skills and high work ability. Vocational education curriculum was prepared jointly with the professional community and professional organizations that are responsible for the quality of service in order to qualify profession professional competence. Vocational education had included professional education. The paradigm of vocational education was to encourage human development comprehensively by building human resources that have a balance between skill and professionalism. Graduates of vocational education were expected to have a balanced ability between soft skill and hard skill.

Respondents (Assistant Director of Academic Affairs and the heads of the study program) also said that currently vocational higher education is required to be able to produce internationally qualified graduates equipped

with professional skills, language skills and intercultural skills. The vocational college should also be able to contribute to the development of graduates who are competent, critical and solutive in dealing with Asean Economic Community (AEC) 2015. The challenges faced today in the development of vocational higher education is concerned with efforts to equip graduates with skills in accordance with the needs of the business world and industry, among others: leadership competencies, digital literacy, communication skill, emotional intelligence, entrepreneurship, global citizenship, problem solving, and teamwork. In line with Pearson study (Finch, 1999) as quoted by tribunnews.com, education era nowadays is no longer just 3Rs (Reading, wRiting, and aRithmetic), but must also involve new skills that are needed by the working world today. Slamet's research also found that vocational education can play a key role in economic development if its alignment with the world of work around it is sought continuously, both in terms of quantity, quality, location, and time.

Vocational education would also play a role in economic development if it is able to integrate its programs with the existence of regulation, policy, planning, and government budgeting in the era of regional autonomy (Slamet, 2011). For Indonesia, the role of vocational education was enormous in promoting more advanced economic growth. The responsibilities of higher education institutions were needed in designing innovative learning process. Based on the guidance of curriculum preparation for vocational education in 2016, the characteristic of vocational higher education was to have profession-oriented and working world oriented graduates profile. The curriculum was designed for learning outcomes, among others graduates that have a standardized professional attitude, practical knowledge, special skills with working world oriented and had general skills in responsibility and could following the standard operational procedures. Therefore, the vocational education curriculum in its implementation should consider appropriate methods, strategies and learning models.

Vocational learning paradigm changed in the current era demand, it needed changes in teaching methods that follow the industry trend change, information systems, quality of education and learners which have a significant

relationship with the pedagogical methods and the needs of the workforce. Assistant Director of Academic Affairs said that nowadays the methods of teaching in vocational education generally was the learners are taught the theory in the classroom and apply them in practice tasks. Supposedly the relevant methods was developed so that learners were able to collect, select, filter, assimilate information in a creative and able to inspire the students to develop skills and to teach students to learn actively and effectively. With limited facilities vocational colleges were required to make improvements to the design and learning process with various alternatives that can answer the demands of the current education paradigm.

According to Kirby Yang, the innovative development of pedagogy and vocational education curriculum in the knowledge-based economy era is aimed at producing the following human resources: (1) creative, innovative, and management skills, (2) having initiative, and able to work independently as a team member, (3) have adaptive and integrative resourceful talents (resources) to meet the needs of technology development (Rau, 2006). According to Hopkin's research results, there are four components in effective vocational education teaching, namely teaching relationships (the relationship of teachers and learners), teaching models, teaching skills and teacher reflection (Hopkins, 2007). The synergy of these four components was believed to be able to support the creation of effective teaching.

In the context of teaching models, vocational education was very relevant in organizing Role-Play & Simulation, Cooperative Learning (CL), Collaborative Learning, Contextual Instruction (CI), Project Based Learning and Problem Based Learning and Inquiry. In addition, vocational education was also relevant organized by Small Group Discussion method, Case Study, and Discovery Learning (DL). In accordance with the characteristics of the process of organizing vocational learning was required lab/workshop/studio that support the achievement of work competence.

ICT Utilization in Vocational Education

Referring to the problems encountered in higher education and the learning paradigm changes in vocational education, the quality

of the developed learning system must be able to quickly fix the various weaknesses. The low quality of education was seen from the educational process and graduates provide an illustration of the low quality of the education system organizing process. Improving the quality of education process should be done, one strategy was to change the conventional learning system with a more effective and efficient learning system with the support of adequate facilities and infrastructure. Learning by utilizing the means of information technology was one appropriate alternative and could overcome various learning problems.

Assistant Director of Academic Affairs described that learning process of Polytechnic education was conducted by face-to-face, structured and independent learning. Face-to-face learning was done with direct interaction between lecturers and students that can be done in classroom, laboratory, or workshop. Structured learning was done with the assistance of the lecturer, and independent learning carried out independently by the student for the purpose of enhancing the knowledge of students to relevant knowledge areas. The head of study programs also explained that the current polytechnic learning system was still characterized Teacher Centered Learning (TCL), where the learning process was centered with the teacher. This condition was not in line with the government's expectation that the learning system in higher education refers to student-based learning system (SCL). The lecturers on FGD shared their experience in implementing learning system in Polytechnic, and they stated Polytechnic learning system should be conducted more portion on face to face learning than online learning. Therefore, the use of ICT in learning in polytechnics can be done by combining face-to-face learning with e-learning approach commonly called Blended Learning.

According to The Clayton Christensen Institute, Blended learning was an instructional methodology that utilizes technology as a more personalized learning approach, giving students opportunities to control time, place of learning, and encourage student speed in the development of a wider and integrated insight. There are four instructional models that are generally applied in the current learning process, namely:

1. Rotation model: learning takes place in a number of different activities, including whole group teaching, small group teaching, peer-to-peer activities, tasks, and individual work on a computer or tablet. In the rotation model, there are several different implementation settings: (1) Station rotation; students learn through a series of classroom activities during one or more class periods, at least one of the teaching activities through technology; (2) Individual rotation: students learn based on individual perceptions determined by lecturers with the help of technology-based assessment tools. (3) Lab rotation: students work on individual and online instructions in the lab either whole class or in small groups; (4) flipped classroom: students receive instruction in the form of online learning outside the day of the lecture and the task or project is done in the classroom with the guidance of the lecturer.
2. Flex model: instructional materials and instruction are given online and the lesson is self-guided. Lecturers remain in place, while the students work independently, individually tailored learning students and lecturers accompany. This model provides flexibility in learning, and lecturers act as mentors.
3. A La Carte model: students receive certain instructions online. Lecturers act as online instructors who are not on campus.
4. Enriched Virtual model: students are asked to conduct face-to-face sessions with lecturers, but then complete their tasks online. Students may not meet with their instructors every lecture schedule, but there are scheduled face-to-face but unlike the optional lecture hours. (Staker & Horn, 2017).

Instructional Model on Blended Learning in Polytechnic

Based on observation and Focus Group Discussion (FGD), it can be resumed that the pattern of learning with more dominant face-to-face was contradictory with the availability of facilities and infrastructure. Polytechnic learning contents required the composition of practice was greater than the composition of the theory in percentage. Limitations of classrooms, limitations of laboratory and workshops including the availability of equipment have not been able to provide opportunities for students to make the

learning process ideally. Limitations were not able to achieve the target as expected from the learning achievement. Many constraints faced by lecturers in transferring knowledge and skills to learners. So, the effectiveness of the learning process was still not effective as expected.

In dealing with field conditions in real terms, the learning process in the polytechnic was not designed in accordance with the schedule of lectures optionally, especially in the process of implementing practical and practicum learning. The heads of department in technology field described that the implementation of practice and practicum in lab or workshop was done with block and semi-block system. This system divided the class member into group according to the project to be done.

Block system in polytechnic was done in practice subject with full time in certain time span without any theoretical lecture. It mean that needed more effort in scheduling. With this block system, there was a relatively long grace period and needed more than one teacher, between the theory given and the practice to be done in line with the theory that already given. The workload of lecturers was not ideal in accordance with national standards of college.

The head of Electrical Engineering Study Program described about semi-block system. In semi-block system, students was divided into working groups on each project differently. The disadvantages were the projects done by each group but they had not followed the instructional sequences activity. This weakness affects the student's understanding of unstructured projects in accordance with the actual work order of practice. This is certainly need a harder effort from lecturers and students in making work instructions.

Observing the real condition of the implementation of learning in polytechnics currently showed that the implementation has not been run effectively, several cause factors were the timing that becomes ineffective, the limited facilities and infrastructure caused the process of learning practices to be unstructured in the order of the actual process. The process of implementing the currently applied learning has not given the guarantee of independence as a learning system based on student centered learning. The current weakness of the polytechnic learning system still refers to the conventional learning system, it's

not yet utilizing ICT as a medium in supporting the effectiveness of learning.

Blended learning class outcomes were better than the classic class. In addition, blended learning students were more active on assignments than regular classes (Mutaqin, Marethi, & Syamsuri, 2016). The pattern of learning in polytechnic was still prioritize the process of face-to-face learning in collaboration with online learning implementation. In the polytechnic learning guide, the assessment component was still consider the level of student attendance in each meeting. Assistant Director of Academic Affairs said that student expected to attend at least 75% of the total lecture hours in one semester. It is intended that students have discipline. Attendance was also the basis of policy evaluation on the success of student learning. Polytechnics may dismiss a student if not complying with the level of attendance in stages through the provision of Warning Letters I (WL I), WL II and WL III were continued with the current graduation ratings be Passed Trial for Absent. The research also observed the Warning Letters history documents.

The research found that the problem faced by polytechnics in the utilization of ICT in learning was not in the ability of lecturers and students in the mastery of technology. From the interviews conducted with the lecturers it is known that the lecturers have not understood how to utilize blended learning instructional model in supporting the learning process. It is necessary to strengthen the ability of lecturers to utilize ICT and encourage cultural change to focus more on online learning system. As known there were four instructional models that exist in blended learning, but not entirely applicable to learning in polytechnic. The choice of instructional model should consider several things, such as learning achievement, instructional media, learning strategies and evaluation.

Formulation of Instructional Model Determination Scheme

Based on data findings in step 1 until step 4, some aspects that become consideration in determining the appropriate instructional model for a college especially in polytechnic were the model and the pattern of higher education, the techniques and methods of learning on each course, and the availability of facilities and

infrastructure. The scheme of instructional model determination can be presented in Figure 2.

Based on the scheme of Figure 2 that is associated with the pattern and characteristics of learning in polytechnics, furthermore can be formulated instructional model on blended learning that can be applied in the learning process of vocational education. The study case of learning at one of Polytechnic in Indonesia found that the determination of instructional model is considered to be done by identifying three aspects as shown in Figure 2.

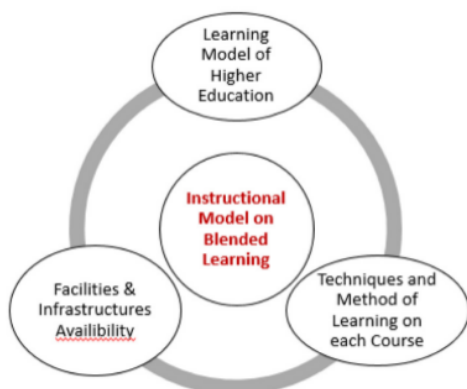


Figure 2. Instructional Model Determination Schema
(source: FGD's result 2017)

Discussion

This research part discussed about the research question based on the research framework in Figure 1. On the first step about the education problem in Indonesia, it can be concluded that there were two main problems which are Indonesia competitiveness rank that was still need to be improved and the low quality of graduates. The second step about vocational education paradigm, it was found that vocational education should be produced skilful graduates that have working world oriented. But it also found that the learning process in vocational education was still categorized as ineffective and inefficient. Then the third step study about ICT utilization, the research found there was blended learning approach that utilize ICT in vocational education, and there were many kinds of instructional model on blended learning that could be implemented in Polytechnic learning to improve its learning process was found on the fourth step.

The discussion section of this paper then would much discuss about the formulation of instructional model determination schema. To determine which of instructional model that suitable with the learning course, the research formulated the schema of instructional model determination that can be seen in Figure 2. The following described the analysis of each indicator that became a consideration in the selection of instructional model in accordance with the characteristics of polytechnic education.

First, learning model was still applied face-to-face approach with a minimum limit of 80% face-to-face and 20% with electronic media. From the techniques and methods of learning aspect, the observation found that with the implementation of e-learning was not an obstacle in the utilization of ICT-based learning. The problem faced is the lack of knowledge and skills of the teaching staff in the utilization of ICT as an alternative in achieving the target of learning effectively and efficiently. The lack of learning culture from teachers become a critical point of the lack of innovative ICT-based learning. It was a challenge for the research site to continue encourage faculty to further improve IT skills. Currently e-learning at Polytechnic served as a supporting e-learning in the provision of digital teaching materials for students as a substitute of the previous textbooks (hand-out) in print. Rusli and Negara (2017) found that animation in multimedia interactive learning gave a positive effect in improving students' learning outcomes. Zere et al. (2016) also found that the use of pictures and sound that is the typical characteristic of e-learning, help to make learning more internalized, which can positively affect students' creativity. Creative content has high impact in the successful of blended learning. All staffs must be well-prepared in order to use ICT and produce creative content. Lalima & Dangwal (2017) stated that well-trained teacher in using ICT and develop content in digital form so that it can be available to students online.

Second, the limitations of learning facilities, especially in the classroom, as well as practical tools were still a constraint in implementing quality learning process. Block or semi-block system that applied in practice subject was still not able to answer requirement of graduate competency achievement maximally. The current system requires less than ideal

learning time and requires a greater number of faculty. So, the learning schedule does not work properly. Gregory et al. (2012) uses blended learning resource to prepare the laboratory preparation (BPORC). BPORC has been shown to successfully improve the capacity of second year students to prepare more effectively for laboratory classes and have a positive impact on the capacity of students to achieve desirable learning outcomes. By using e-learning resource to prepare laboratory class, students can learn the theory and identify the problem online, so the face-to-face and laboratory section can be done well and more case study can be solved. For limited resource of laboratory tools, a use of virtual laboratory such as used by Ye et al. (2016) can be considered to implement using blended learning in research site.

Third, the techniques and methods of learning in research site were still designed for the needs of conventional learning systems with the dominant system with face-to-face. Conventional learning patterns such as this do not provide opportunities for students to be more flexible in learning. The weakness of this conventional system makes the learning system not achievable based on student (SCL). The use of blended learning system is highly relevant to the need to produce graduates to have comprehensive capabilities. The pattern can combine the theory of behaviourism, cognitivist and constructivism to form meaningful learning. Zere et al. (2016) found that e-learning will enable students to specify their learning trend with respect to their own problems and abilities. This independence in studying and learning is the effective element in learning that is not used in regular traditional classes; the ICT application in e-learning enables learners to control their learning process. Yagci stated that learning supported by online learning methods could have a positive effect on increasing student motivation, and therefore have a positive effect on academic success (Yagci, 2016).

From the aspect of the availability of facilities and infrastructure and also network infrastructure, based on the survey results is considered sufficient in the implementation of learning systems based on blended learning. So, the implementation of blended learning in research site is very potential to be applied. The implementation of blended learning system for research site has considerable benefits in order

to overcome the problem of availability of study space, study time, and the availability of practice equipment and practicum which is still not sufficient. With the compilation of curriculum in each study program, one of the implementation requirements of blended learning can be fulfilled in terms of availability of learning achievement.

By looking at the real condition of the learning process in research site, the instructional model in the appropriate blended learning is by applying the rotation model. That's because of 80% classroom meeting (face-to-face approach) regulation. So, rotation model was the suitable instructional model for Polytechnic. There were many types of instructional model, namely station model, rotation lab, individual rotation, and flipped classroom. Station model, rotation lab, and flipped classroom model can be applied in Polytechnic. But one sub model that cannot be applied is individual rotation model. This is because the system used in Polytechnic was based on Semester Credit Units in package form. The students could not determine the choice of courses to be taken in one semester. Therefore, the students could not individually choose their online learning course.

In theory learning that held in classroom, students are divided into groups with different learning tasks. One of these groups can take advantage of online media in the development of knowledge. In theory learning is implicitly embodied in it skills as a course achievement. With the implementation of this station model method, it can give special benefit in learning achievement with respect to the development of character and attitude of independence, special skills, general skills, and knowledge in accordance with the demands of the curriculum based on the Indonesian National Qualification Framework (KKNI).

The lab rotation model allows students to rotate in learning on predetermined schedules. Some students may study in the lab with the supervision of the instructor and some learn independently using the online media on the instruction of the lecturer who handles the course. The point in this model is that students still refer to the concept of face-to-face approach supported by the use of online learning media and can run effectively with the limited facilities owned in the lab/workshop. Next is the flipped classroom model, which is an inverted learning

model that lecturers present the material through online media and use face-to-face classes to provide an explanation of the work of the given task or project. So that lecturers can have more time in facilitation and provide understanding to students in more detail for completion of task or project.

For other instructional models, such as flex models, A La Carte models, and Enriched Virtual models are difficult to apply because they do not fit the learning characteristics of polytechnics. In flex models where learning follows the needs of students and has a very high freedom to make choices. It is not possible to apply in polytechnics with educational policies that have been established in the system and educational guidelines. A La Carte model provides learning to online students and lecturers, where face-to-face learning is a complement to online learning. Included also with Enriched Virtual instructional model that makes the learning process entirely online. Surely this is not in accordance with polytechnic education policy. This is in line with Chou's concept of conducting research on the most optimal proportion of face-to-face with e-learning. The study found that the best proportion for face-to-face meetings with e-learning is 2: 1, then 1: 1 and the worst is 3: 1 (Chou, Chuang, & Zheng, 2013).

Based on the analysis of FGD results and observations it has been found that the learning pattern based on blended learning relevant to polytechnic is by rotation model method. Furthermore, in implementing this rotation model should be followed by instructional design of relevant learning model. Aspects to consider were:

1. Course content and learning unit analysis, such as subject content, coverage, relevant topics and semester credit units;
2. Learner analysis, such as student education background, age, sex, employment status;
3. Learning context analysis, such as what the desired learning competition should be discussed in depth in this section;
4. Instructional analysis, such as what teaching materials are grouped according to importance, arranging tasks from easy to difficult;
5. State instructional objectives. This instructional objective may be structured on the basis of the results of the instructional analysis;

6. Construct criterion test items. The preparation of this test can be based on the stated instructional objectives;
7. Select instructional strategy. Instructional strategies can be established based on existing facilities.

CONCLUSION

Based on the study that has been done, there were three considerations in formulating the right instructional model for blended learning. First was the institution learning model, second was the course's technique and method of learning, then third the institution facilities and infrastructures. In accordance with these considerations, it can be concluded the right instructional model on Blended Learning in Polytechnic is the Rotation Instructional Model. There was one type of rotation instructional model that could not be applied in Polytechnic, it was Individual Rotation Model. The others type namely station model, rotation lab, individual rotation, and flipped classroom could be applied in Polytechnic. The study had implications on the learning process in Polytechnic. The lecturers could use the schema to determine the instructional model that suitable on their courses. In research site, practice courses that held in laboratories or workshops really appropriate to apply the lab rotation model in its application due to the condition of learning facilities and infrastructures.

ACKNOWLEDGEMENT

Gratitude is dedicated to DRPM DIKTI who has funded this research and Universitas Negeri Yogyakarta who are willing to guide us in the implementation of research, and also Politeknik Negeri Bali which gives full permission and support for this research. We would like to thank the Cakrawala Pendidikan which provides an opportunity to publish the results of this research.

REFERENCES

- Abie, S. 2014. Curriculum Models: Product versus Process. *Journal of Education and Practice*.
- Brooke, E. 2015. *Learning and Rosetta Stone Four Keys To Success Using Blended*

- Learning*. Lexia Learning. Retrieved from www.lexialearning.com.
- Chou, C. T., Chuang, C., & Zheng, B. 2013. The study of blended learning on a vocational high school in Taiwan. *International Journal of Modern Education and Computer Science*.
- Divayana, D.G.H.2017. Evaluasi Pemanfaatan E-Learning Menggunakan Model CSE-UCLA, *Cakrawala Pendidikan*, XXXVI(2)
- Finch, C. R. 1999. *Curriculum Development in Vocational and Technical Education: Planning, Content, and Implementation*. Pearson.
- Ghirardini, B. 2011. *E-learning methodologies: A guide for designing and developing e-learning courses*. Food and Agriculture Organization of the United Nations (FAO).
- Gregory, Sarah-Jane, Trapani, D., Jenny. 2012. A Blended Learning Approach to Laboratory Preparation. *International Journal of Innovation in Science and Mathematics Education*
- Haider, G. 2016. Process of Curriculum Development in Pakistan. *International Journal of New Trends in Arts, Sports & Science Education*.
- Herayanti, L., Fuadunnazmi, M., & Habibi. 2017. Pengembangan Media Pembelajaran Berbasis Moodle Pada Matakuliah Fisika Dasar. *Cakrawala Pendidikan*, XXXVI(2)
- Hopkins, D. 2007. *Every School a Great School*. Maidenhead: McGraw Hill/Open University Press.
- Kartikasari, D., Sinarti, Hidayat, R., & Irsutami. 2014. Analisis Persaingan Pendidikan Tinggi Di Batam Dari Perspektif Politeknik Batam. *Cakrawala Pendidikan*, XXXIII(2)
- Lalima, & Dangwal, K. L. 2017. Blended Learning: An Innovative Approach. *Universal Journal of Educational Research*
- Mutaqin, A., Marethi, I., & Syamsuri. 2016. Model Blended Learning Di Program Studi Pendidikan Matematika UNTIRTA. *Cakrawala Pendidikan*, XXXV(1)
2016. *Pedoman Penyusunan Kurikulum Pendidikan Vokasi*. Indonesia: Direktorat Pembelajaran dan Kemahasiswaan Kemenristekdikti .
- Rau, D.-C. C.-T.-P.-H. 2006. Development and Teaching Approaches of Technical and Vocational Education Curricula. *9th International Conference on Engineering Education*. San Juan-Puerto Rico.
- Rusli, M., & Negara, I. K. R. Y. 2017. The Effect of Animation in Multimedia Computer-Based Learning and Learning Style to the Learning Results. *TOJDE: Turkish Online Journal of Distance Education*
- Saliba, G., Rankine, L., & Cortez, H. 2013. *Fundamentals of blended learning*. University of Western Sydney.
- Slamet, P.H. 2011. Peran Pendidikan Vokasi Dalam Pembangunan Ekonomi. *Cakrawala Pendidikan*, XXX(2)
- Staker, H., & Horn, M. 2017, October 10. *Classifying K-12 Blended Learning*. Retrieved from www.christenseninstitute.org: <https://www.christenseninstitute.org/wp-content/uploads/2013/04/Classifying-K-12-blended-learning.pdf>
- Suyanto. 2006. *Dinamika Pendidikan Nasional (Dalam Percanturan Dunia Global)*. Jakarta: PSAP Muhammadiyah.
- UU Republik Indonesia No. 12 Tahun 2012 Tentang Pendidikan Tinggi. (n.d.).
- UU Republik Indonesia No. 20 Tahun 2003 Tentang Sistem Pendidikan Nasional. (n.d.).

- Wong, K.-T., Hamzah, M. S., Goh, P. S., & Yeop, M. A. 2016. Blended E-Learning Acceptance as Smart Pedagogical Tools: An Initial Study in Malaysia. *TOJET: The Turkish Online Journal of Educational Technology*.
- Yagci, M. 2016. Blended Learning Experience in a Programming Language Course and the Effect of the Thinking Styles of the Students on Success and Motivation. *TOJET: The Turkish Online Journal of Educational Technology*.
- Ye, L., Wong, N. S., Ho, J. W. Y. 2016. Design, Development and Evaluation of Biochemistry Virtual Laboratory for Blended Learning, *JED: GSTF Journal on Education*
- Zare, M., Sarikhani, R., Salari, M., & Mansouri, V. 2016. The Impact of E-Learning on University Students' Academic Achievement and Creativity. *JTET: Journal of Technical Education and Training*

ORIGINALITY REPORT

14%

SIMILARITY INDEX

9%

INTERNET SOURCES

3%

PUBLICATIONS

8%

STUDENT PAPERS

PRIMARY SOURCES

1	www.tojet.net Internet Source	1%
2	www.lexialearning.com Internet Source	1%
3	penerbit.uthm.edu.my Internet Source	1%
4	Marlya Fatira, Anriza Witl Nasution, Ismi Affandi. "Preparing Islamic Human Resources Competencies as Generation of Digital Bankers in Polytechnics Vocational Education", <i>AJIS: Academic Journal of Islamic Studies</i> , 2019 Publication	1%
5	Submitted to Pfeiffer University Student Paper	1%
6	digilib.unimed.ac.id Internet Source	1%
7	icge.unepadang.ac.id Internet Source	1%

openjournals.library.sydney.edu.au

8	Internet Source	1%
9	worldwidescience.org Internet Source	1%
10	Submitted to Midlands State University Student Paper	1%
11	Submitted to Northcentral Student Paper	<1%
12	Submitted to Universitas Negeri Semarang Student Paper	<1%
13	Submitted to HotChalk Inc Student Paper	<1%
14	Submitted to Immaculata University Student Paper	<1%
15	www.slideshare.net Internet Source	<1%
16	int-e.net Internet Source	<1%
17	Submitted to UIN Syarif Hidayatullah Jakarta Student Paper	<1%
18	Submitted to Taipei Medical University Student Paper	<1%
19	Submitted to Teachers' Colleges of Jamaica Student Paper	<1%

20 uad.ac.id <1%
Internet Source

21 Submitted to University of Southampton <1%
Student Paper

22 Submitted to Greenwich School of Management <1%
Student Paper

23 Phu Vu, Christopher Michael Knoell, Amy Nebesniak, Jane Strawhecker. "chapter 21 Gamified - Blended Learning Professional Development: A Descriptive Case Study", IGI Global, 2017 <1%
Publication

24 Najeh Rajeh Alsalhi, Mohd. Elmagzoub Eltahir, Sami Sulieman Al-Qatawneh. "The effect of blended learning on the achievement of ninth grade students in science and their attitudes towards its use", Heliyon, 2019 <1%
Publication

25 Submitted to Aurora University <1%
Student Paper

26 Submitted to Goshen College <1%
Student Paper

27 Submitted to Program Pascasarjana Universitas Negeri Yogyakarta <1%
Student Paper

28	files.eric.ed.gov Internet Source	<1%
29	reecemath.com Internet Source	<1%
30	lib.unnes.ac.id Internet Source	<1%
31	Sami Al-Qatawneh, Mohd. Elmagzoub Eltahir, Najeh Rajeh Alsalhi. "The effect of blended learning on the achievement of HDE students in the methods of teaching Arabic language course and their attitudes towards its use at Ajman University: A case study", Education and Information Technologies, 2019 Publication	<1%
32	www.ijeionline.com Internet Source	<1%
33	www.moent.gov.pk Internet Source	<1%
34	Submitted to Kennesaw State University Student Paper	<1%
35	Submitted to Universitas Sebelas Maret Student Paper	<1%
36	Submitted to University of North Carolina, Charlotte Student Paper	<1%

37 KİHOZA, Patrick D, ZLOTNİKOVA, Irina, BADA, Joseph Kizito and KALEGELE, Khamisi. "An Assessment of Teachers' Abilities to Support Blended Learning Implementation in Tanzanian Secondary Schools", Ali Şimşek, 2016. <1%

Publication

38 Submitted to University of Saint Francis <1%

Student Paper

39 Submitted to Universitas Jember <1%

Student Paper

40 Submitted to Grand Canyon University <1%

Student Paper

41 Submitted to University of Brighton <1%

Student Paper

42 Submitted to Samford University <1%

Student Paper

Exclude quotes Off

Exclude matches Off

Exclude bibliography On

Dewi_etal_2018_CP

GRADEMARK REPORT

FINAL GRADE

/100

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12
