

C29_Haryanto_The_Development_of_Blended_Learning_ICMED_2019

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Submission date: 13-Jun-2020 06:42AM (UTC+0700)

Submission ID: 1342835898

File name: C29_Haryanto_The_Development_of_Blended_Learning_ICMED_2019.pdf (469.52K)

Word count: 3910

Character count: 22816

Conference Paper

The Development of Blended Learning Theories of Learning Course for Educational Technology Student in FIP UNY

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Abstract

Education is intended to develop students' potential ability to respond the emergent local, national, and global phenomenon. However, today's disruption era has forced educational institutions to better prepare the students in facing the global dynamics. Thus, Educational Technology Department in Faculty of Ilmu Pendidikan UNY (*State University of Yogyakarta*) attempts to facilitate the students with various abilities to accommodate the needs above. Therefore, this research is aimed to develop *Blended Learning* learning model which is implemented in *Teori Belajar dan Pembelajaran (Learning and Instruction Theory)* course.

This research adopts procedure of Borg and Gall (1983), learning system design model of C. M. Reigeluth, and combined with E. L. Criswell & Luther model, by; a) conducting preliminary research, b) devising plans, c) developing prototype model, d) testing materials and model experts followed by revisions, e) running user tests, and f) carrying out field experiment. Research produces *Blended Learning* learning model in *Teori Belajar dan Pembelajaran* course for undergraduates of Educational Technology Department in Faculty of Ilmu Pendidikan UNY employing *besmart version 2 e-learning* owned by UNY. To conclude, *Blended Learning* has proven feasible to be executed successfully, both from materials and learning media point of view as well as its convenience when used by students.

Keywords: learning model; Blended Learning; *Learning and Instruction Theory* course.

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Received: 2 May 2019

Accepted: 19 June 2019

Published: 3 July 2019

Publishing services provided by
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Selection and Peer-review under the responsibility of the ICMEd Conference Committee.

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1. Introduction

National education is aimed to develop the potential of all citizen. Education is also projected as a process to facilitate changes on students as micro-settings, nearby environmental changes as meso-settings, and bigger scale changes as macro-settings [1]. Therefore, education should be contextual with the changing environment and society condition in all scales, i.e., local, regional, and national, and global.

Recently, specific condition prevalent in disruption era is rapid technological advancement, highly efficient work culture, extremely competitive working environment, gradually driven by new type of jobs that replace traditional works. Nowadays, technology is more than merely entertainment since technology may also affect people's way of thinking, learning, and interacting [2]. Moreover, in industrial context, technology is not only able to aid people, but it may further replace human's role hence several professions will likely reform and vanish. As consequences, education field is also challenged with the power of technology that enables the work process to be far more effective, more efficient, and more interesting in all work market sectors. If this condition is not anticipated, then there will be huge mismatch between education, people, industries, and workforces.

On the other hand, *Blended Learning* is considered as one of learning models capable to maintain traditional learning model principle through *face-to-face* direct learning activity and employ *e-learning* or website technology [3]. Therefore, this research intends to develop *Blended Learning* (e-learning) learning model for Teori Belajar dan Pembelajaran (*Learning and Instruction Theory*) course to respond the disruption era as prevalent phenomenon and fulfill the required skill and knowledge important for 21st century generation, such as learning and innovating, thinking critically, solving problems accurately, demonstrating high creativity, communicating and collaborating well, and mastering digital literacy, i.e., information, media, and technology.

2. Literature Review

This development of learning model plays an important role in learning activity where development becomes the next step of message design and learning strategy [4]. There are several researches about *Blended Learning* learning model, for instance, Dian Wahyuningsih and Asri Budiningsih in 2014 wrote "Implementasi Blended Learning by the Constructive Approach (BLCA) dalam pembelajaran Interaksi manusia dan komputer" [5]. Another research was also conducted by Sheren Dwi Oktaria and Asri Budiningsih (2018) entitled "Pengembangan model Blended Learning menggunakan *e-learning* berbasis moodle pada mata kuliah Genetika di Prodi Pendidikan Biologi Universitas Bengkulu" [6]. However, those researches have not yet considered any arrangement strategy of learning variables to achieve learning goals thus the ability of the previously developed model might still be doubted. Therefore, this research is conducted to develop *Blended Learning* learning method for *Learning and Instruction Theory* course for undergraduate students in TP FIP UNY by specifically designing: a)

strategy of online material organization for conceptual, principles, and procedural substances, whereas substances to develop creativity, solve problems, and build personal behavior are provided in direct meetings, b) strategy of conveying materials is delivered via online, direct meetings and assignments, c) strategy of learning management is done individually, in group, and classically.

Exclusively, this *Blended Learning* learning model consists of lecturing materials on: behavioristic, cognitive, constructivist, humanistic, cybernetic, multi-intelligence, and neuroscience learning theories. Medias involved are texts, pictures, and videos developed by using web *e-learning UNY besmart version 2*.

3. Material & Methodology

3.1. Data

Research is conducted in Educational Technology Department, Faculty of Ilmu Pendidikan UNY, on lecturers who excel in their own fields and also on students as users. Data collection method is done by interviews, questionnaires, focus group discussions and observations. Obtained data consists of learning, content (material), learning model, programming and visual aspects. Research credibility is achieved by 1) observations and interviews are done in couple (between the rater), 2) triangulation through focused reflections and discussions involving students, expert teams, and lecturers, 3) colleagues, expert teams, and model users peer briefing.

Data analysis is processed using qualitative descriptive technique through steps; ⁵ a) abrupt data, b) coding data, c) data selection, d) data recording and data organization, e) quantitative analysis, f) qualitative analysis, and g) results interpretation. Quantitative descriptive technique is used for data from the expert, main field, and operational field tests. Data is formed as statements; very good, good, enough, poor, and very poor which translated into 5-scaled quantitative data, i.e., score 1 to 5.

3.2. Method

This research and development practice adopts the procedure of Borg and Gall (1983), learning system design model of C. M. Reigeluth, and combined with E. L. Criswell & Luther model, by; a) conducting preliminary research, b) devising learning plans and small scale experiments, c) developing draft (prototype) model, d) testing material and model experts followed by revisions, e) running user tests, and f) carrying out field

experiment, g) main field experiments followed by revisions, and h) operational field tests.

Validation of instrument and product is done as follows; research instrument arrangement and testing are done by material and learning model experts. Instrument testing is conducted to figure out; 1) whether respondents understand the developed items inside the instruments, 2) whether respondents are able to make choice/decision upon the answers of each item, 3) whether respondents are able to give reasons/considerations about their decisions. Inputs and recommendations are used to revise the instruments. This activity is done as a test step for research instrument validity.

Validation of *Blended Learning* learning model is conducted by material and *Blended Learning* learning model experts and then followed by model revision. Product validation is done by students of TP FIP UNY in three steps, first, initial field tests (5 people) who were chosen randomly then followed by revision, second, main field tests (10 people) and followed by revision, and third, operational field test in real class followed by revision. Product validation test is completed to figure out the quality of *Blended Learning* learning model about the functionality aspect of students' learning.

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4. Results and Discussion

4.1. Result

4.1.1. Preliminary research

Preliminary research is conducted by examining learning components in accordance to design development steps which stated by C.M. Reigeluth; course goal and characteristic analysis, learning source and media analysis (deterrent), student characteristic analysis, learning outcomes (CP) or goals and learning content or material, strategy determination of learning content organization, strategy determination of learning content delivery, strategy determination of learning management, and developing measurement procedure of learning result.

Goals and characteristic course analysis are conducted by examining course's document, especially the corresponding RPS which becomes the learning guidelines. *Learning and Instruction Theory* learning outcomes (CP) and its characteristic for Educational Technology FIP UNY undergraduate students are arranged in specific order to encourage students to possess positive behavior and perception toward studies of learning theories and its practices in learning activity. In detail, students, both independently

and in group, are able to achieve, integrate, expand and utilize their knowledge about learning theories to figure, assess learning problems and value the knowledge to solve encountered problems, as well as write down their ideas coherently and objectively in regard to manage learning process contextually. Below are the course materials studied by students; behavioristic, cognitive, constructivist, humanistic, cybernetic, multi-intelligence, and neuroscience learning theories.

Next, analysis is done on references employed in the course. This is done by team's discussion who teach *Learning and Instruction Theory* course including learning faced problems. Result shows that the main difficulty in delivering *Learning and Instruction Theory* materials is student's insufficient knowledge about *Learning and Instruction Theory*. Media often used in learning process are computer and LCD projector.

Learning process strategy used before was employing learning approach that combines expository method practiced by lecturer with structured assignment completed by students in form of presentation document (in group) and applied assignment (individually). Grading is focused on student's involvement in classroom general interaction, presentation quality and feedback given by fellow students related to the written idea, quality of paper tasks which are both viewed from substantive and transmission in form of formal paper, as well as the quality of mid and final exam answers.

Student characteristic analysis is done by analyzing the last three academic years students who have completed *Learning and Instruction Theory* course. Students with formal thinking ability are able to think in abstract, critic and logic ways by using thinking pattern "probability". This ability enables students to draw conclusions, make interpretations, develop hypotheses, work systematically, engage combinatorial analysis and think proportionally. Therefore, ability to think critically by comparing concepts, principles and procedures can be done individually (via online) without lecturer's presence.

The next activity is doing group evaluation between researchers who teach *Learning and Instruction Theory* course. Results of analysis and evaluation show that this course is unfamiliar to first semester students thus it needs additional instrument to give basic understanding of learning material. Considering the lecture is limited and conducted only in sixteen meetings, not to mention there are many theories should be learnt, then it is agreed to utilize *e-learning* to deliver entry behavior, especially for independently learnt learning material.

This *Blended Learning* model is designed by employing:

1. Strategy to organize online material for conceptual, principle and procedure-based materials, while materials to develop creativity, solve problem and behavior building are delivered in direct meeting,
2. Strategy to convey material is done by online, direct meeting and assignments,
3. Strategy to manage learning is directed individually, in group, and classically,
4. Aside of using texts, *Blended Learning* model is planned by using pictures and videos.

4.1.2. Development of blended learning learning model

The proposed *Blended Learning* learning model is designed interchangeably between online lectures and direct meetings. Researcher analyzes learning goals or outcomes and selects the material which is suited to be brought online and which materials would be fitted to be presented by direct meeting. Afterwards, research identifies tasks and activities required to be completed in learning process then develops evaluation tool to measure student competence after finishing the lecture. Next, *e-learning* is designed, such as the content, resources, video, pictures, features and the others.

For online meetings, *e-learning* model is used. *E-learning* is developed by using *web e-learning* already owned by UNY, namely *besmart version 2*. Below is the *homepage* of the proposed *e-learning*:



The screenshot shows a course page with the following content:

- Teori Belajar dan Pembelajaran**
- Teacher: **Sisca Rahmadonna**
- Description: Mata kuliah ini mempelajari teori-teori belajar dan penerapannya dalam pembelajaran, agar mahasiswa dapat menganalisis pembelajaran yang terjadi di sekolah dan dapat memberikan saran dan ide untuk perbaikan pembelajaran di sekolah. Mata kuliah ini berbicara tentang teori belajar behavioristik, teori belajar kognitif, teori belajar humanistic, teori belajar konstruktivistik, teori belajar sibernetik (pemrosesan informasi), teori belajar sosiokultur, teori belajar kecerdasan ganda, dan teori belajar neuroscience.

Figure 1: *E-learning homepage of Learning and Instruction Theory course.*

According to Figure 1 above, the *homepage* enables students to receive short explanation about the course. This is meant to give the students little description about the subjects that will be studied.

4.1.3. Material expert test and revision

Material test on *Learning and Instruction Theory* that related to its reliability, deepness, and broadness is done by involving one lecturer from Curriculum and Educational Technology Department. Based on the result of this material test, it is found that the developed *e-learning* is very good. This conclusion is derived from the result's average value of 3.83 which if converted falls into very good grading range. Below is grading recapitulation from the material expert.

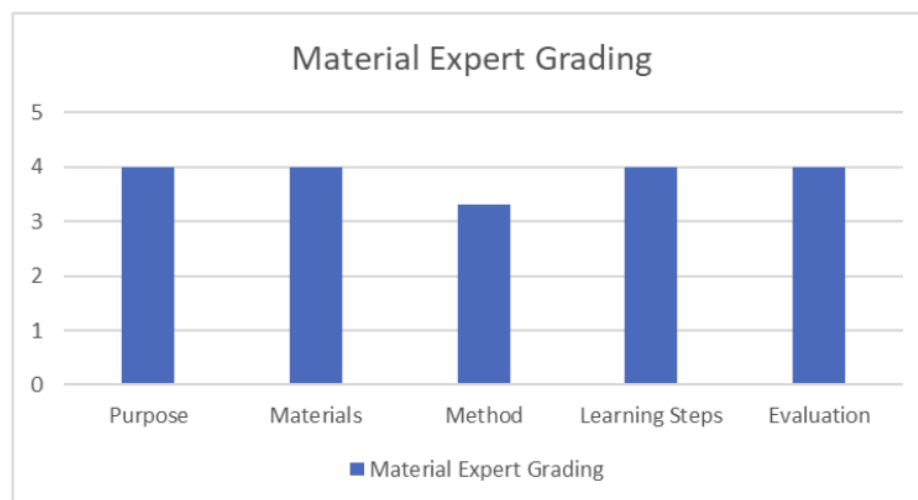


Figure 2: Recapitulation chart of material expert grading.

Based on the chart above, almost all of the grading components produce very good result. The only exception is in "Method" that lies on good value range (3.33). According to the material expert, this is due to material delivery method that is given in each *e-learning* meeting is monotonous with less variation. However, generally the material expert values that proposed material are suited and can be tested without revision. Material expert gives recommendations to attach learning plan (RPS) in pdf format in the beginning of course. Nevertheless, this could not be accomplished since the learning plan will be given directly in the beginning of first meeting. This is intended to build discussions between lecturer and students about anything related to learning process hence the incoming course becomes the result of the agreement between lecturer and students.

This assessment is planned to be the material of next study in developing process of *e-learning*. Although the expert states that revision is not required, research team

has decided to undergo revision by adding learning videos in order to make learning process more interesting and less monotonous.

4.1.4. Media expert test and revision

Media validation test is commenced by involving lecturer of *e-learning* from Curriculum and Educational Technology Department. The result shows average value of 3.6. This value if qualitatively converted represents a very good range. Details of media expert assessment result are depicted below.



Figure 3: Media expert scoring chart.

Based on the graph above, it is shown that the scoring distribution of media expert lies inside good and very good range. Material structure, design, text size and assignment variation are components included in good categorization. Several considerations are made to focus the revision on changing the text size written on the attached learning paper and assignment variations. Previous text size on the attached paper used *Calibri 11pt*, then enlarged into *12pt* using the same font type. Whereas in assignment variations, each theme is added by forum and writing paper assignments. Discussion forum is aimed to discuss one of parts in *e-learning* (learning video), paper assignment is given to the students as preparation before direct meeting learning.

Figure above indicates that the discussion forum enables lecturer and students to discuss existing learning material topics. Discussion forum consists of open questions intended to give stimuli for students to think broader, critically, and creative in accordance to the learned material context.



Figure 4: An example of one of discussion forum in *e-learning*.

4.1.5. Field test and revision

Field tests have been conducted twice, instead of three as planned before, due to the limited research time. The first test examines five second-semester students who have completed *Learning and Instruction Theory* course as research samples. These field tests are aimed to measure how far *e-learning* could be developed to assist students in mastering *Learning and Instruction Theory* material.

Generally, the first field test result shows that the developed *e-learning* is already categorized good and receives average value of 3.4. Details of the first field test result can be examined in graph below.

According to the data above, each measured component has achieved good results. However, material attractiveness receives the lowest score by average value of 3, though it is still categorized as good. Those test results also indicate that the developed *e-learning* is ready to be harnessed in real learning process.

However, test result data that designates feasible average value in learning process still requires revisions. Several notes derived from the test results are:

1. Writing errors or typos on several material parts still persist,
2. Learning videos presented in English are hardly understood by the test subjects.

The two notes above then are utilized as revision material to perfect the developed *e-learning*. As result, the English language videos are given additional explanations in Bahasa regarding the main contents. Additionally, inputs from one of the students are also expected for direct meeting. According to the respondent, an explanation about *e-learning* need to be delivered to the students in direct meeting class. This is due to

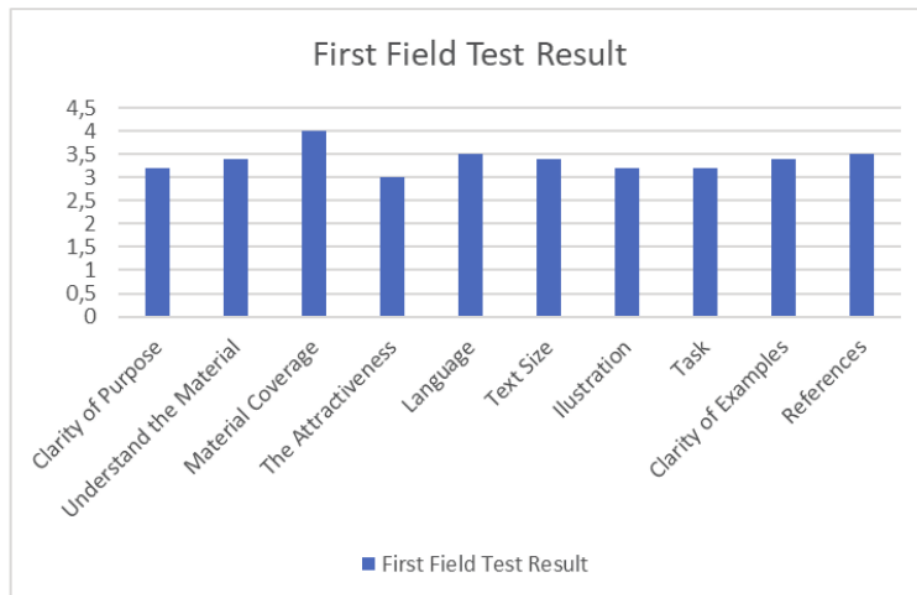


Figure 5: Analysis chart of the first field test result.

the user students are new students whose most of them have not understood about *e-learning* and *blended learning* yet.

Lastly, the second field test or operational test is conducted in a real class consisted of 40 students for two weeks to measure its real performance. The operational test result produces the average value of 3.8 and therefore also classified as good.

4.2. Discussion

Blended Learning is an effective combination of several learning process delivery model, learning model, and student's learning style in online and direct learning interaction [7]. Based on that statement, this research is focused on the online and direct learning development for *Learning and Instruction Theory* course.

As known before that the important thing in implementing *Blended Learning* is good learning control done by both lecturer and students, this learning development put more attention on material content will be delivered by online and direct meeting. By online, the material is developed by using UNY's *e-learning besmart* program. This program makes material delivery variations and indirect meeting between lecturer and students are possible to do. By online, learning is focused on student's understanding about learning theories, concept and principles. Whereas by direct meeting, learning

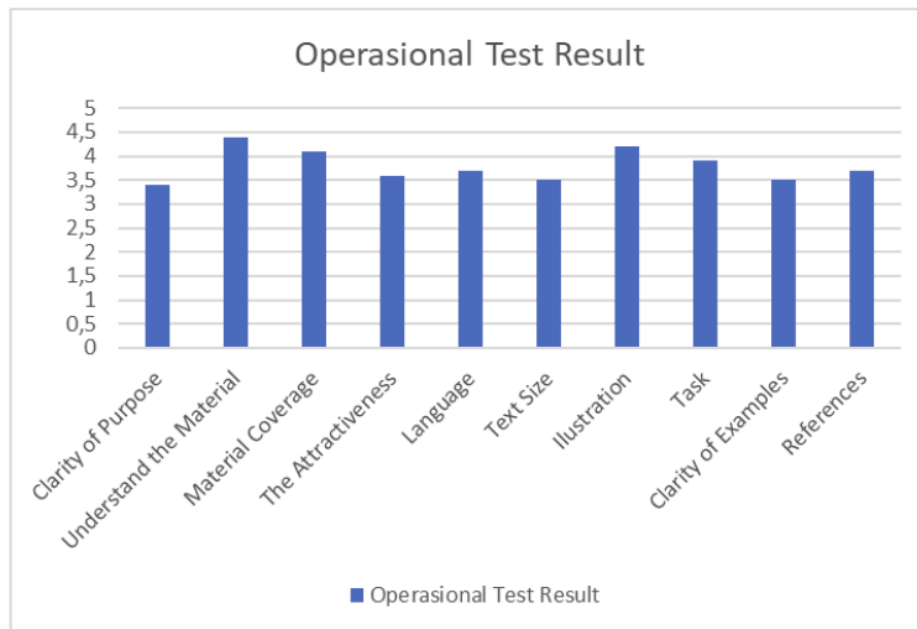


Figure 6: Analysis chart of operational test result.

is more focused on discussions, group learning as well as on creativity, behavior, and problem-solving development.

Research result shows that the developed online learning by UNY's *besmart* is feasible to be utilized for Educational Technology students who are enrolling *Learning and Instruction Theory* course. This *e-learning* can help giving primary understanding about theory, concept, and learning principles before students are given direct learning session. Based on the field tests and interviews with test subjects, most of the subject agree that this proposed *e-learning* will be more effective if given by using combination of direct and *blended learning*.

Those statements are well suited with the needs of twenty first century and disruption era where digital based learning is capable in providing their needs. Therefore, *Blended Learning* learning model that combines direct meeting and online learning is important to be developed. Where in the learning planning, strategy of material organization is made in two-ways. Online lecture is harnessed to give students understanding about conceptual, principles and procedural materials, whereas material to develop creativity, solve problem, as well as behavior and value building can be designed to be given in direct meeting learning process.

This research also considers the components that should be highlighted in *blended learning* lecture model development, especially about *performance support materials*.

Performance support materials is auxiliary teaching materials that can increase the capacity of understanding and memory. Auxiliary teaching materials need to be prepared to augment student's knowledge. Material is presented in digital form and can be accessed both online and offline. In online learning (*e-learning*), each part of material is always supplemented by videos to attract student's attention and to broaden student's perspective about the learned theory, thus the obtained lesson can be ingrained into their long-term memory.

5. Conclusion

According to the result analysis and discussion sections above, several conclusions can be derived as:

1. *Blended Learning* learning model is developed by using research and development steps adapted from Borg and Gall, C. M. Reigeluth, and combined with E. L. Criswell & Luther models.
2. *Blended Learning* model is designed by means of: a) strategy of online material organization for conceptual, principles, and procedural substances, whereas material to develop creativity, solve problems, and build student's behavior are allotted in direct meetings, b) strategy of conveying materials is applied via online, direct meetings and assignments, c) strategy of learning management is done independently, in group, and in classical manner.
3. The developed online learning is proven to be feasible in terms of material and media. This result is also in accordance with field tests results that involve students as the user subjects.

Based on the conclusions, there are recommendations to give:

1. Due to student's limited knowledge of foreign language (English), detailed explanation about video content is needed as supplementary material in online learning.
2. Considering the hardships of getting video content of learning theory in Bahasa and, on the other hand, plentiful references (books and online articles) presented in English, students are advised to improve their English proficiency, especially in reading and listening skills.

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