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Research Article

Developing a Learning Model Based on Hybrid Learning and PjBL

Muhammad Sabir Ramadhan[1*] and Rumondang[2]

[1]Study Program Engineering Information Universitas Asahan, Kisaran North Sumatera Indonesia.
[2]Study Program Aquaculture Universitas Asahan, Kisaran North Sumatera Indonesia.

Abstract.
Currently, student interest in teaching and learning in schools is declining, coupled with high youth unemployment, the same is also happening in universities. The existing learning model is only teacher-oriented, tends to be passive in order to reduce the nature of learning, students must continually build new ideas based on their learning experiences in order to be able to think creatively and solve problems in the material presented by the teacher. The model of electronic learning (e-learning) in higher education institutions that takes advantage of the advantages of information and communication technologies (ICT), offers a concept of learning where there is a transformation of learning from conventional form to digital form, both in content and in system. has shortcomings, namely not having interaction in the learning process; Project-based learning (PjBL) is one of the innovative learning implemented, but it has not had a sufficient impact on increasing the activity, creativity and productivity of students, especially in the design of a project. This study aims to determine the needs desired by lecturers and students in implementing learning in the multimedia and animation technology course. Results of research that based on the needs analysis performed, students expect the presence of a new learning model that can maximize learning. Based on the needs analysis carried out, the teacher expects a new learning model capable of maximizing learning. Lecturers and students expect a learning model capable of collaborating in the use of information technology and skills required in the 21st century.

Keywords: Hybrid learning; PjBL; learning model; multimedia; animation

Corresponding Author:
Muhammad Sabir Ramadhan;
email: ramasabir@gmail.com

1. Introduction

Currently, the world has entered a new industrial revolution, namely Industrial Revolution 4.0 (Fourth Industrial Revolution). This industrial revolution fundamentally changed the way humans live, work and interact [1]. This revolution is occurring with immense scale, scope and complexity with new technological advances that integrate the physical and digital world, affecting all disciplines, economy, industry and government. The concept of Industrial Revolution 4.0 finds new models and mechanisms of action when technological advancements come so fast, which gradually dominate the joints of human and everyday life. This industrial revolution is marked by the birth of artificial intelligence in a variety of product formations that can function as optimized human

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brain function. These types of "artificial intelligence" include supercomputers, intelligent robots, driverless vehicles, etc. Overall, seven areas have experienced breakthroughs that are the result of new technological advances in Industrial Revolution 4.0, including ((1) artificial intelligence robotics, (2) nanotechnology, (3) biotechnology and (4)) quantum computing technology, (5) blockchain (like bitcoin), (6) internet technology, and (7) 3D printers [2].

Industrial Revolution 4.0 is a fundamental revolution that must face careful preparation, as it requires a variety of basic skills that are not yet demanded by today's job market. When there are great changes in a rapid period of time, there are bound to be new demands on the subject of revolution. New capabilities are one of those requirements. These abilities are basic skills and deep learning skills. These capacities are listed below:

TABLE 1: Basic Skills dan Deep Learning Skills.

Basic Skills	Deep Learning Skills
	Global Citizenship
	Collaboration
Write	Character
Read	Communication
Count	Creativity & Imagination
Remember	Real World Problem Solving
	Critical Thinking Knowledge Construction
	Use Of ICT For Learning

The relationship between foundational skills and deep learning skills has various determinants that influence it. However, the determinant that most influences this relationship is the philosophy of education. Indeed, the philosophy of education is an area of philosophy that describes the relationship between education and the underlying philosophy [3]. The philosophy underlying education is a compass that guides human development. So, when we are now in the era of industrial revolution 4.0, we need an educational philosophy that guides us towards the demands of this revolution.

Higher education institutions in Indonesia, as a place where students gain knowledge and expertise before entering the world of work, should have realized the importance of deep learning for their students. It is not enough today for universities to equip their students with basic knowledge and skills, but also to start developing deep learning skills. Higher education must constantly educate and prepare its students so that they

later acquire deep learning skills that have become demands in the age of the industrial revolution 4.0. This applies to professional and non-professional universities.

One of the skills in deep learning skills is the use of technology for learning (use of ICT for learning) which can be applied by using e-learning in the learning process . According to Purnomo, the use of ICT or the Internet in the world of education will help the world of education to increase the number of students [4]. There will be more and more students who can be reached via the Internet. Besides increasing the quantity, so too does the quality. As described above, increasing the number of learners can degrade the quality of the education they receive. The provision of Internet technology can be an anticipator of this possibility.

The e-learning model or known as e-learning in higher education which uses the advantages of information and communication technologies (ICT), offers a concept of learning in which there is a transformation of learning from conventional to digital form, both in content and in system. In general, e-learning is able to present meaningful "pedagogical" learning experiences or experiences through intensive use of communication and information technologies. Currently, the concept of e-learning is widely accepted by the global community, as evidenced by the widespread implementation of e-learning in educational institutions. There are several advantages to developing an e-learning learning program, namely: (1) very dynamic e-learning programs can be presented in a variety of attractive, engaging and interactive presentation formats; (2) operated around the clock so that students could obtain the necessary information about the course materials as needed; (3) learn individually, each student can choose at any time the desired format or learning model and the one that best matches their background; and (4) comprehensive, offering various forms of learning activities from various sources that allow students to choose a learning format or method and the exercises offered.

However, in its implementation, it turns out that online learning still meets various obstacles, including: (1) in online learning, there is no interaction in the learning process ; (2) the teaching and learning process certainly requires a system that can perform the process in both directions; (3) feedback is certainly needed for better and perfect learning outcomes; (4) Although a lot of material is obtained using e-learning, the learning process can be done anywhere and anytime, even less efficient.

Different barriers to the implementation of e-learning are the basis for the emergence of blended and blended learning models. These two learning models have been developed to perfect e-learning where this model combines face-to-face and e-learning in a single unit, which means that these two models have the same character, namely

in the proportion of face-to-face and online sessions and those given. In blended learning, the learning process is still ongoing in traditional classrooms through face-to-face assisted technology (including internet technology) which is used to facilitate activities, deliver content, deliver of value to students and others. While in blended learning, traditional classroom sessions and online classes are integrated with much of the face-to-face time being replaced by online.

Regarding the use of blended learning to increase students' interest in learning, Ino Angga Putra suggests that through the blended learning model, student activities become more so that students become active and student-centered learning while teacher activities in blended learning act as facilitators and guides for students [5].

2. Methods

2.1. Development Model

Research and development methods (research and development / R&D) is included in the 'need to do' research category, i.e. research the results of which will be used to assist in the implementation of the work, so that if the work is assisted by products resulting from R&D, it will be more productive, effective and efficient. Therefore, this research and development (R&D) method is used for the preparation of the thesis. Research and development (R&D) methods are included in the sequential model of combined research methods. Sadiman defines research and development as a process or steps to develop a new product or improve an existing product, which can be justified [6]. These products do not always come in the form of objects or material (hardware) such as books, modules, classroom or laboratory learning aids, but can also be software (software) such as computer programs for data processing, classroom learning, libraries or laboratories, or models of education, learning, training, guidance, assessment, management, etc.

2.2. Development Procedure

2.2.1. Preliminary Research (Preliminary Research Step)

This step aims to analyze the main issues underlying the importance of the HLBP learning model. This step is divided into 2 parts, namely (a) the needs assessment and (b) the literature review.

2.2.2. Needs Analysis (Needs Assessment)

The needs analysis in this study aims to formulate a reasoning about the need to develop the HLBP learning model by analyzing the learning process of multimedia technology and animation that has taken place so far, in analyzing the objectives and content of the multimedia technology and animation course, analyzing student characteristics and analyzing learning resources. The steps followed for the four steps are as follows:

1. Initial study of the project-based blended learning model (HLBP).

The initial investigative step is necessary to uncover problems in learning multimedia and animation technology that result in less effective learning outcomes for students. To obtain this data, discussions were held with lecturers who taught courses in multimedia and animation technology, as well as the study of the existing documentation of the value archive, the program and the SAP.

To obtain data on the need to develop the HLBP learning model, an analysis of the learning conditions of multimedia and animation technology has been carried out so far, analyzing the learning objectives and content of multimedia and animation technology, analyzing student characteristics and analyzing the learning resources used. All activities in this phase are aimed at two things, namely (1) the rationality of the need to develop the HLBP learning model and (2) preparing the material to design an overview of the HLBP learning model.

1. Analysis of the objectives and contents of the multimedia technology and animation course.

   This step is performed to determine the multimedia and animation technology learning goals to be achieved. The result of this activity is the compilation of HLBP learning tools, namely: Syllabus, SAP and GBPPfor the multimedia technology and animation course.

2. Analysis of student characteristics

   Student characteristics are defined as individual aspects or qualities in the form of multimedia technology and animation values obtained and study habits of students. The value of multimedia and animation technology is derived from the valuable archive. Information on students' study habits was obtained from professors who have taught multimedia technology and animation courses at the Computer Engineering Studies Program, Faculty of Engineering, Asahan University.

3. Analysis of learning resources

The initial survey of learning resources for multimedia and animation technology was conducted with the aim of finding out what sources of learning were available and could be used to convey learning content, what were the weaknesses of the existing learning resources. The information obtained from the results of this activity will be used as an excuse to develop HLBP learning models and HLBP learning tools.

2.3. Trial Sample

The test subjects in this study were professors and students. The validators in the development of this learning model are curriculum / learning model experts, educational media experts, assessment experts and language experts.

For the limited practice tests, 5-6 students are enrolled in the odd semester 2019/2020 Multimedia Technology and Animation course. This limited essay is part of the formative assessment in the development of the HLBP learning model which includes the collection of interview, observation and questionnaire data.

2.4. Data Collection Instruments

This type of research data consists of quantitative data, to obtain this data in this study consists of pre-research instruments. Preliminary research has been carried out to obtain data in the form of information on the needs and expectations of students in learning multimedia and animation technologies. This instrument has been developed on the basis of indicators of the principles and nature of vocational learning in higher education and the national education standards (SNP). The pre-research instrument is a questionnaire on learning multimedia and animation technology that has been implemented and an analysis of learning needs for multimedia and animation technology at present. The necessary research instrument analysis was developed with the performance indicators of the Linkert scale whose validity and reliability were tested on 6 students who were not included in the research sample.

2.5. Data Analysis Techniques

The data analyzed in this study are data validation results, field test data, and efficacy test results data. Data analysis from this research was performed using descriptive statistical analysis techniques and descriptive techniques. The descriptive statistical

technique is used to analyze the test of learning outcomes, while the descriptive technique is used to analyze the results of the questionnaire. Descriptive techniques are used to describe the data from the pre-research analysis. The data collected is in the form of data resulting from the analysis of the learning of multimedia and animation technologies that was carried out and the analysis of the needs in terms of learning of multimedia technologies and animation to the current time. The analysis of this data takes place in four stages, namely data collection, data reduction, data presentation and conclusions development.

3. Results and Discussion

This needs analysis step aims to see the current conditions and the needs of students and teachers in learning. So that at this point he can describe the description of the description between the current state and the priorities / needs of the students regarding the skills of the 21st century and the expected learning process in learning the programming algorithms in the 'Higher Education. The subjects of this study were students of the Computer Engineering Study Program, Faculty of Engineering, Asahan University.

The technique of data collection is done by distributing questionnaires in the form of questionnaires that have been tested for the validity and reliability of the questionnaire. The research sample for this needs analysis includes up to 30 students who have taken courses.

The questionnaire for data collection can be viewed in the annex, while the results of the needs analysis questionnaire regarding the current state and a description of the priority / needs of the learning process can be found in the annex. Based on the analysis of research data, the needs analysis explains that:

The current conditions related to the learning process show that the 21st century skill touch (critical thinking, communication, collaboration, creativity) has not yet occurred. The description of the description of current conditions can be seen from the average student responses to the given questionnaire. The average questionnaire that students answered was 2.45, which can be assumed that the current model of learning applied to students has not been able to touch these four aspects. This is also in line with the priorities / needs of the students for future learning. Based on the priority questionnaire / student needs, we know that the average score obtained is 4.45. This shows that the students have a lot of hope for the development of learning in the future. So that

one touch of the four skills can be achieved. For more details, it can be seen from the following graphic:
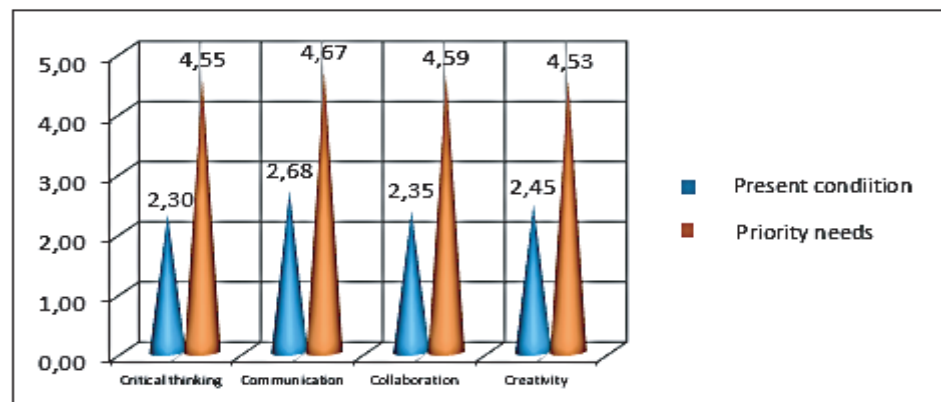

Figure 1: Analysis of Student Needs on The Development of Learning Models.

Based on the questionnaire on the current state of teachers, it can also be seen that the teacher has also confirmed that the four skills have not been affected by the current learning model. This can be proven from the average value of the needs analysis questionnaire given to teachers, namely 2.37. The questionnaire also shows that the speaker hopes that there will be many learning models that can improve the four skills. So, with this model, the learning process in the classroom becomes even better. This can be proven from the mean value of the priority questionnaire in teacher learning, namely 4.48. For more details, it can be seen from the following graphic.

In the development process, the researchers used the ADDIE development model. This model consists of 5 stages, namely: analysis, design, development, implementation and evaluation. Based on the analysis step problems described above, it is known that in the lecture process, the learning model used is not optimal. So that it does not help the students to evaluate the material which has been received according to the learning characteristics of each individual. The researcher therefore wishes to develop a learning model based on blended learning adjusted to the expected skills. The description of the needs analysis carried out by the researcher was in line with the steps of the Widodo & Jasmadi needs analysis, as cited by Ashhar, namely (1) determine the skills that were formulated; (2) identify and determine the scope of the skill unit or part of the main skill; (3) identify and determine the knowledge, skills and attitudes required; and (4) determine the model to be developed.

The choice of a learning model based on blended learning is due to the development of the skills currently expected for it. This statement is reinforced by Daryanto who
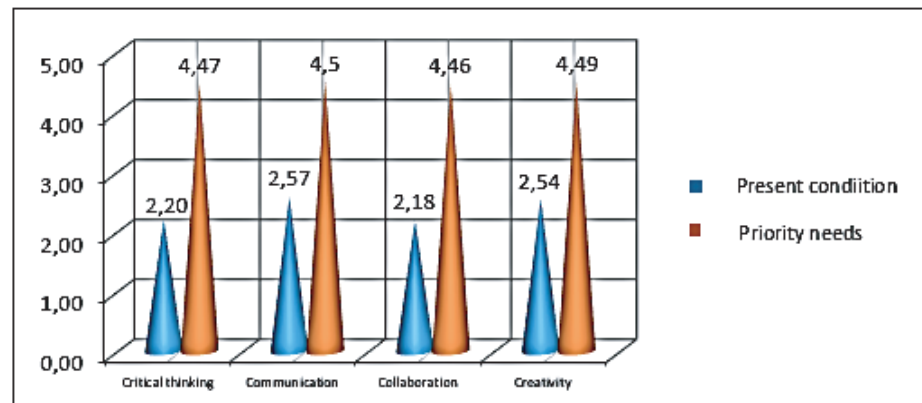
Figure 2: Lecturer Needs Analysis on Learning Model Development.

argues that the presence of information technology can help expose the material in more detail and draw students' attention to learning [7].

4. Conclusions

The development of Viva Video Digital Art as a Learning Media at SMA Negeri 8 Padangsidimpuan using DDD-E (Decide, Design, Develop, Evaluate). The average result of due diligence based on BSNP on expert validator assessment on that is with validity criteria both {Valid and no need to revise (feasible)}. The development of viva video media in electrolyte and non electrolyte solution material is expected to be applied to students in school.

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