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Digital-Based Learning Application Model in Schools

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Abstract— The rapid development of science and technology has been anticipated by the government through the Merdeka Belajar (freedom to learn) policy initiated by the Education and Culture Ministry of the Republic of Indonesia. One of the responses about that policy was the development of a digital-based learning application model. This study used a research design based on Resarch and Development (R&D). The purposes of this study is to develop a digital-based learning model that is able to provide freedom of learning for teachers and students in the digital learning process. The results showed that the digital-based learning model which its development was based on inputs in the form of an independent learning policy and the digitalization movement; element of process in the form of student-centered learning; element of output in the form of fun and flexible learning; and the element of intact results in the form of the establishment of student competencies.

Keywords— Digital-Based Learning Model, Freedom to Learn, Laboratory School

1.   Introduction

The development of the world, which is currently entering the era of the industrial revolution 4.0, where information technology has become the basis of human life becomes very influential on various aspects of life. This condition is also called the fourth revolution era that known as digital revolution which any information can be quickly obtained anywhere and anytime [1]. The industrial revolution 4.0 has emerged as a new era in the development of civilization, marked by the development of Artificial Intelligence (AI) which has the impact of digitalization and automation in various sectors of life such as in trade, industry, mining, tourism, education, to the use of digital money in commerce [2]. It is further stated that the development of AI itself has two main implications in education. First, educational research needs to be conducted by covering various fields relevant to AI development in order to provide a fast service to the public. Second, a revolution in curriculum and learning needs to be carried out immediately.

Related to the second implication, [3] explained that learning should prioritize literacy and deep understanding of how various systems work in the world compared to only learning through robotic tutors. Based on this opinion, the major implications of the fourth industrial revolution on education will require changes in education governance starting from facilities and infrastructure, teacher quality, curriculum, and learning systems so that outcomes are able to produce appropriate to the needs of the world of work. Meanwhile, [4] explained that students are now included in the 'Z Generation Group' which is the generation born after 1995. This generation tends to be free, individualistic, and highly dependent on technology and the need to quickly obtaining information through digital media and the internet. Therefore, this character must be facilitated in the educational process so that students can get the education that suits their needs. Along with the development of technology and its supporting infrastructure, the efforts to improve the quality of learning can be made through the use of this technology in a system known as Digital Learning (*Pembelajaran Digital*). Digital learning is a system that can facilitate learners to learn more broadly and variously. Through the facilities provided by the system, learners can learn anytime and are not limited by distance, space and time. The learning material being studied is more varied, not only in verbal form, but also more varied in text, visual, audio, and motion. [5] argue that there are shifts and differences in the paradigm of learning patterns between conventional learning and learning using technology. There are also differences between the concept of learning in a class (classroom setting) and digital learning that does not always have to be in a classroom. These models have differences in terms of teaching styles, techniques and motivation of learners and teachers. The digital learning model is an effective future model because it is in accordance with the demands of the development of science and technology.

Research related to digital learning is done through multimedia, as according to [6] Value-based interactive multimedia in social science learning is the integration of life and social values studying learning material into interactive multimedia by involving students through integrated practice in Indonesia. The model is carried out in several steps: material and character negotiation, material presentation, group division based on junior high school social science topics, exploration of character values according to the topic, and integrated practice (initial observation to school, multimedia scenario development, multimedia production, multimedia simulation in the classroom, and the practice of using multimedia in schools). There is a significant difference between classes using interactive multimedia value-based through integrated practices with conventional classrooms. Therefore, students at the teacher education institute, as prospective teachers, must be equipped with the ability to create multimedia-based interactive values through a combination of theory with practice, and a combination of practice in the classroom and at school. In addition, the rapid development of science and technology provides enormous opportunities for the development of learning models from conventional to digital-based learning. This is done so that the administration of education is able to keep up with the current development, especially in the field of technology. The development of this learning model is carried out by paying attention to the values and characters that are characteristic of each school (in this case The Lab School).

Through this research, it is hoped that a digital-based learning model can be developed which is able to provide freedom in learning for students based on the characteristics of the school being developed. In addition, freedom to learn for teachers in developing digital learning materials and media and for students in the process of developing digital learning (*pembelajaran digital*) at the Jakarta State University (UNJ) Lab School, the Indonesian Education University (UPI) Lab School, Ganesha Education University Lab School (UNDIKSA)), and Padang State University (UNP) Lab School. For this reason, researchers feel the need to develop digital learning as an implementation of independent learning to see the demands that exist in this era of the industrial revolution 4.0, because it is clear that the field of education and learning is the expertise of researchers as some research has been done in the last few years.

2.   Research Methods

This research was designed using the Research and Development (R&D) approach because the focus of the research was oriented towards the effort to develop and validate products. Another reason was the focus of the research in finding and creating new knowledge about models and things that are being discussed today. In the result, it produced a certain product and at the same time test its practicality and effectiveness [7]. In line with this opinion, this research seeks to develop a digital-based learning model that was able to provide freedom in learning for teachers and students in the digital learning process carried out in four laboratory schools (Lab school), there were the Jakarta State University (UNJ) Lab School, Indonesian Education University (UPI) Lab School, Ganesha University of Education (UNDIKSA) Lab School and Padang State University (UNP) Lab School. By carrying out research in the four research locations, it was hoped that it would be able to provide broader information about the implementation of the concept of *Merdeka Belajar* (freedom to learn) through digital-based learning.

Furthermore, in order to fulfill this research, it was equipped with various data obtained from the results of the survey, documentation and focus group discussions involving experts and related officials with an interest in the implementation of this digital-based learning. Then the results of collected data were analyzed using the Milles and Huberman model. The technical analysis consists of data reduction, data presentation, and data verification and analysis was carried out using theories and the results of previous research related to this research [8].

3.   Findings and Discussion

3.1 Digital Based Learning Concept

Based on the results of research that has been conducted on students and teachers in four Lab Schools related to the conceptual digital-based learning model within the framework of *Merdeka Belajar* (freedom to learn), conceptually digital-based learning is carried out with the values of *Fun and Flexible Learning*. The general concept of digital-based learning is a learning innovation that is oriented towards freedom in learning. It means that *Merdeka Belajar* (freedom to learn) requires students to be able to learn according to their interests and talents. As the results of the previous study stated that digital technology must be use as a tool that can increase collaboration and motivate students to re-engage with education and enable them to develop skills [9]. Moreover, students are not fixated on learning only at school in following lessons, but students can also freely learn anytime and anywhere. The poin is the development of technology-based learning should be aimed at

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facilitating the interaction between teachers and students wherever and whenever [10].

Moreover, the concept of *Fun and Flexible Learning* in digital-based learning is based on the *Merdeka Belajar* (freedom to learn) policy initiated by the Education and Culture Ministry of the Republic of Indonesia which is directly proportional to the existence of a digitalization movement in every aspect of human life in the world. As is the development of digital-based learning, learning innovation can also be developed into fun learning so that it can achieve the formation of student competencies. Besides, the Covid-19 pandemic situation provides special affirmation of the importance of digital learning to support *Merdeka Belajar (freedom to learn)* initiative while maintaining social and physical distance while promoting flexible and fun learning [11]. The conceptual digital-based learning can be described through the following visualization:
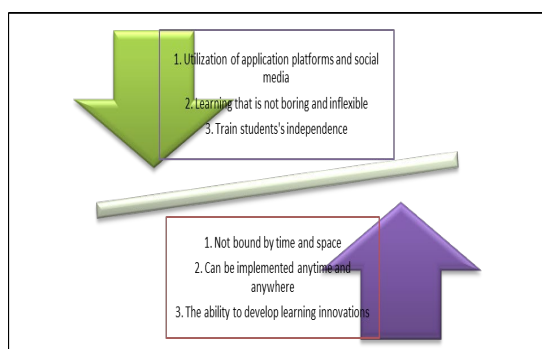

Figure 1. Conceptual Digital Based Learning Model (Source: Data processed by the Research Team, 2020)

Based on the visualization from figure 1 above, conceptually the digital-based learning model that is carried out must fulfill two elements, which are being fun and being flexibility. In terms of enjoyable learning, the learning process must at least be demonstrated by three things: 1) utilization of application platforms and social media; 2) learning that is not boring and inflexible; and 3) ability to train students's independence. The characteristics of fun learning need to start from a school environment that supports teachers to conduct learning session¸ and other facilities that support the creation of fun learning for students [12]. The results of research implemented in four Lab Schools would provide information that

digital-based learning can be carried out in a fun method for teachers and students. This can be shown by the use of various application platforms and social media that are able to provide students with independence in studying so that the learning process is not overwhelming. Furthermore, the learning referred is in accordance with the research which states that there is a need for the participation of all school stakeholders to support the use of technology in the learning process [13]. On the other hand, the characteristics of flexible learning are also shown by three things: 1) it is not bound by time and space; 2) it can be implemented anytime and anywhere; and 3) it has the ability to develop learning innovations. Teachers should be able to develop digital teaching materials as a learning tool used in learning that cannot be implemented in class [14]. It supports the conceptualization of the flexibility of learning that is carried through the development of this digital-based learning model. This is because the developed learning in this research is more dominant anywhere. This means that digital-based learning developed through this research is not limited by time and space.

Based on that description, the conceptual digital-based learning that has been developed in four Lab Schools has put forward the concept of *Fun and Flexible Learning*. Especially in the midst of the Covid-19 pandemic, the challenge for teachers to develop flexible and fun learning is very tough. Therefore teachers must be able to pay attention to the digital readiness that is in themselves and in students. This is also reinforced by the results of previous research which show that the readiness of various interested parties in school is a major factor in the realization of an effective digital learning [15].

3.2 The Overview of Digital-Based Learning in Schools

The idea of *Merdeka Belajar* (freedom to learn) that is developed by the Education and Culture Ministry of the Republic of Indonesia¸ cause logical consequences for the development of digital-based learning. The development of digital-based learning is inseparable from the emergence of the 4.0 industrial revolution era as part of the development of science and technology (IPTEK) which prioritizes digitalization in every aspect of human life. This absolutely becomes a challenge

for the implementation of learning in Indonesia that need to prioritize the values of life for students by using integrated technology. As is in the previous study that explained about living values based on interactive multimedia which integrates learning and the values of life with multimedia [16]. This research affirms that digital-based learning is very possible to be implemented in order to improve student competence. It is also supported by the development of various social media platforms that accompany teachers and students in everyday life to the point that the existence of technology for the development of learning in schools can no longer be denied.

Moreover, in the midst of the Covid-19 pandemic that is currently happening, the Education and Culture Ministry has implemented a distance learning policy (online or *daring*) for every level of educations from primary to higher education. As a consequence, learning which is usually done face-to-face now has to be replaced with an online or virtual space. It comes from the urgency to expand a digital-based learning model that is able to advance student competencies and interest in learning. It is also promoted by the results of prior research [9] which states that digital-based learning development can be applied as an effort to solve globalization problems. As it is known, the covid-19 pandemic is also one of the globalization problems that presently hit all around the world.

Based on the results of research conducted on each Lab Schools in the Indonesian Education University (UPI), Jakarta State University (UNJ), Padang State University (UNP) and Ganesha Education University (UNDIKSHA) generally learning using digital platforms has been applied. The survey results show that digital-based learning is clearly recognized by 94.2% of students and 98.7% of teachers as a breakthrough in the use of technology in interactive and interesting learning. Teachers and students are agreed that the benefits of digital-based learning can increase learning motivation because it can provide opportunities for the development of an interesting and absorbing learning atmosphere. Therefore, teachers and students acceptance for digital-based learning towards learning motivation in UPI, UNJ, UNP and UNDIKSHA Lab Schools is very high. Digital-based learning praxis can be visually described as follow:
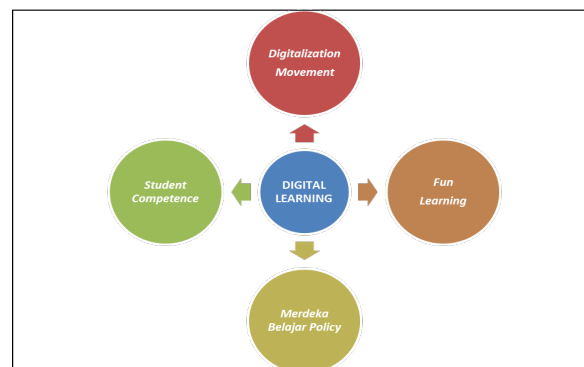

Figure 2. Visualization of Digital Based Learning Praxis (Source: processed by the Research Team, 2020)

According to the figure 2, it is clear that the development of digital-based learning is a logical consequence of the development of *Merdeka Belajar* (freedom to learn) policy by the Education and Culture Ministry of the Republic of Indonesia which is directly proportional to the existence of a digitization movement in every aspect of human life in the world. The development of digital-based learning means that learning innovation can also be developed into fun learning so that it can achieve the formation of student competencies. It is in line with the results of research [17] which states that the challenge of digital learning is how educators design a learning that can improve students' critical and creative thinking to innovate in various fields of life by using technology information.

Based on the results of research that has been done, digital-based learning is able to provide benefits for students, including: 1) distance learning; 2) students are able to access additional material available on the internet; 3) utilization of various social media platforms as learning media; and 4) increasing students motivation to learn. It shows that distance learning by utilizing various social media platforms is able to provide a means of adding learning material so that it can rise up students motivation in learning. For example, using *flipbook digital* learning media as a smart solution to present a learning atmosphere in the classroom that is more attractive, communicative, interactive and encourage students' understanding of the material that has been delivered by the teachers [10].

The benefits of developing digital-based learning for teachers include: 1) flexibility in implementing learning; 2) able to access additional material available on the internet; 3) utilization of various social media platforms as learning media; and 4) increase motivation in teaching. It can be seen that the development of digital-based learning, especially during the Covid-19 pandemic can be an alternative for improving the teaching and learning

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process in order to achieve enjoyable learning, for both teachers and students. That statement is also supported by former study on the development of teacher competency in Citizenship Education in the midst of the 4.0 industrial revolution [18]. The research shows that through the 4.0 industrial revolution, teachers are increasingly motivated to develop learning activities in the classroom and the diversity of media learning. It means that the teacher has sufficient flexibility to promote various needs in implementing learning.

Furthermore, platforms that are used as digital-based learning media include: 1) Google [Gmail, Google Classroom, Google Meet and Google Drive]; 2) Social media [Whatsapp, Twitter, Facebook, and Instagram]; 3) Zoom application and 4) E-Leraning developed by schools and other institutions. The use of various platforms mentioned above is of course taking into account the aspects of ease and intensity of use by teachers and students in daily life. Moreover, the ability and skills to use ICT (Information Communication Technology) in quality learning, development of digital learning materials that can be used by the wider community to increase knowledge and competence, and as well as digital learning evaluations are further strengthened through training, research and development programs [17]. Therefore, digital-based learning that is implemented is able to provide comfort for both teachers and students.

Although digital-based learning has been developed and implemented in the four Lab Schools studied, there are obstacles that were found by both teachers and students. Some of these obstacles include: 1) not all teachers and students have the availability of adequate internet facilities; 2) there are some teachers and students who lack of skills in using internet-based technology; and 3) the limitations of the two-way interaction. Previous research regarding the readiness of teachers to use digital devices states that although access to smartphones is evenly distributed to teachers and students, the aspect of use in supporting learning activities has not shown significant improvement [19]. It is further stated that the use of smartphone is still limited to its basic functions as a tool of communication such as making calls, receiving calls, sending short messages (SMS), and it is not yet fully understood as a tool to develop learning.
Based on the results of research related to the practical conditions of digital-based learning, it is stated that digital-based learning has a very high acceptance for both teachers and students. It is because with the development of digital-based learning, both students and teachers have the opportunity to put up on a fun learning. It can also

encourage teachers to expand student competencies that are expected by the curriculum.

3.3 Digital Learning Application Model Design

A digital-based learning model can be produced based on the conceptual development that has been developed. This model is promoted on a systemic basis with a careful consideration of input, process, outputs and complete results regarding the learning that is carried out. It is believed to be able to obtain the expected results. The digital learning application model within the framework of *Merdeka Belajar* (freedom to learn) visually can be seen in the following figure 3:
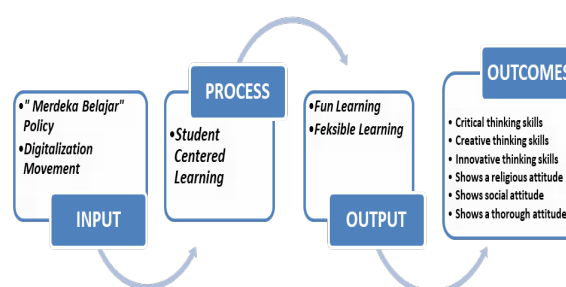

Figure 3. Design of Digital Based Learning Application Model (Source: Research Team, 2020)

Several things can be explain based on the visualization above related to the important components in the digital-based learning application model. First, regarding the input (input) to develop a digital-based learning model. The role of this input is very important as a foothold and support for the development of digital-based learning. The input of this model are *Merdeka Belajar* (freedom to learn) policy and the existence of a digitalization movement in every aspect of life. The Education and Culture Ministry's policy regarding *Merdeka Belajar* (freedom to learn) is a new idea that puts forward the improvement of the learning quality that is simpler than before through the use of technological developments around teachers and students. It is also in line with the changing era that lead to digitalization movements in every aspects of ourlife. The main achievement needed in the education system or more specifically in learning methods in the era of the industrial revolution 4.0 is students expertise in some new literacies [data literacy, technology literacy, and human literacy] [20]. It indicates that the advance of the 4.0 industrial revolution which is the background for *Merdeka Belajar* (freedom to learn) policy must be understood as a foothold that needs to be sustained through the development of digital-based learning.

Second, regarding the digital-based learning process. The process of a model really determines the results that need to be developed in a model itself. process activities in digital-based learning are determined by the implementation of learning that is carried out which must prioritize student-centered learning. It means that students have more roles in digital-based learning activity. On the other hand, the teacher's role is only as a facilitator, guiding and directing students in using various technology platforms in the teaching and learning process. Therefore, it is necessary to have teachers who are able to understand the needs and characteristics of students in order to properly plan learning activities in student-centered digital learning [21]. A student-centered learning process requires the best possible preparation from the teacher. Another previous studies show that student-centered learning can be integrated with the use of various local wisdom values that are packaged attractively with the use of digital media [22]. This type of learning can also be implemented if the teachers are able to understand the students's condition.

Third, regarding digital-based learning outcomes. The output produced in the development of a model is largely determined by the input and the executed process. In this case, the expected outcome is that learning is fun and flexible. It is possible to achieve by relying on the *Merdeka Belajar* (freedom to learn) policy and the availability of technology platforms that were created by the digitalization movement. It is also supported by a student-centered learning process that provides flexibility for students to create and understand the learning objectives. Moreover, teachers will be more focused on providing understanding as well as providing direction and guidance to achieve the expected competencies of students. Referring to the conceptual digital-based learning that has been developed in four Lab Schools that have put forward the concept of *Fun and Flexible Learning*, it requires the readiness of various interested parties in schools to be the main factor in realizing the effectiveness of digital learning [15].

Fourth, the complete results in the development of digital-based learning. This part is the culmination of the carried out stages. It explains the expectations that need to be achieved in digital-based learning. The complete results that must be achieved are student competencies which include: 1) Critical thinking skills; 2) Creative thinking skills; 3) Innovative thinking skills; 4) Shows a religious attitude; 5) Shows social attitudes; and 6) Shows a thorough attitude. That competencies can be obtained if there is a sustainability between the input, the processes and the outputs that are carried out in digital-based learning. Furthermore, to be able to achieve the expected competencies in digital-based learning, teachers must optimize the utilization of digital learning resources properly [23].

Based on the description above, it can be concluded that the digital-based learning model in this study is developed adaptively and systematically. Adaptive means that it is adjusted to the demands and needs of readiness that encourage the implementation of digital-based learning. Moreover, systematically shows the linkage of all elements related to the achievement of hopes for implementing digital-based learning within the framework of *Merdeka Belajar* (freedom to learn).

4.　　Conclusion

According from the findings and discussions of this research, the development of a digital-based learning model is carried out in order to support *Merdeka Belajar* (freedom to learn) policy that initiated by the Education and Culture Ministry of the Republic of Indonesia. This digital-based learning model is based on mutually sustainable elements, there are: 1) The input elements *Merdeka Belajar* (freedom to learn) policy and the digitalization movement]; 2) The process elements [student-centered learning]; 3) the output elements [*fun and flexible learning*]; and 4) the intact results element [the formation of student competencies].

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