



The Importance of Research and Science Innovations to Improving Education and Learning Systems

Radia Hafid^(✉) and Fatmawaty Damiti

Gorontalo State University, Gorontalo, Indonesia
{radiahafid, fatmawatydamiti}@ung.ac.id

Abstract. The Covid-19 pandemic requires everyone to adapt to new things, including in the world of education, especially in the learning process. The inability to adapt and transform will add to the problem and slow down efforts to achieve the goals of education itself. Therefore, efforts and strategies are needed such as creating various kinds of research and scientific innovations to support the learning process. This research is a qualitative research based on the literature review method. The results of this study indicate that (1) teachers or instructors must have skills so that educational institutions need to facilitate their educational staff with technological developments, (2) development and use of digital learning media such as e-learning, youtube, interesting learning videos, and so on, (3) innovation such as conducting learning through project based learning and case based learning.

Keywords: research innovation · science · education · learning

1 Introduction

Facing the current era of globalization, information and communication technology has developed very rapidly, including in the field of education in the use of learning media. During the Covid-19 pandemic, there have also been many changes in the learning strategies of both teachers and students. When students and teachers cannot meet face-to-face in learning activities at school, teachers are challenged to improve their ability to master technology in order to meet teaching targets and feedback from their students. This encourages education stakeholders to participate in digital literacy, which is the ability to obtain, understand, and use information that comes from various sources in digital form [1].

If you only blame the current situation, change will be difficult. So there needs to be innovation in learning by utilizing what can be utilized. The importance of educational innovation is needed so that learning in Indonesia continues to run effectively, such as utilizing information and communication technology for the realization of online learning methods.

This research is as expressed by [2] in which the results of his research explain that in this case the development of education in the form of an innovative learning model

that was initiated to solve online learning during the covid-19 period with the form of the BACA DULU learning model where learning is carried out online and combining offline and online learning.

Digital learning media is currently very helpful in the learning process, namely with various media such as e-learning, YouTube, animated videos and so on that can increase the enthusiasm of students in participating in learning both online and face-to-face. Learning media in general is a tool in the teaching and learning process. In addition, learning media are everything that can be used to stimulate the thoughts, feelings, attention and abilities or skills of students and make it easier for teachers or lecturers so that they can encourage an effective, efficient, and enjoyable learning process.

2 Discussion

2.1 Skills (Skills) that Must be Possessed by Educators Regarding the Use of IT Systems

Expertise in using digital learning media is very much needed in the industrial era 4.0 because it is related to the individual's ability to know, understand, and use hardware and software to overcome various problems of daily life. No exception in the world of education, digital skills are the main part that determines how the quality of education will be formed.

To realize the achievement of national education goals, several supporting factors are needed in the process of achieving it, these factors include human resources, facilities and infrastructure, capital and so on. However, of these various factors, the most important and very influential factor in the success or failure of education is human resources. The current of modernization and technology that is growing rapidly requires the availability of more qualified teachers. These qualified teachers will have a very positive influence on the learning program [3].

Educators are an important component in education. In Law No. 14 of 2005 concerning Teachers and Lecturers Article 2 paragraph 1 it is explained that teachers have a position as professionals at the level of basic education, secondary education, and early childhood education in the formal education pathway which are appointed in accordance with statutory regulations. Professional teachers are teachers who are able to manage themselves in carrying out their daily tasks [4]. The professionalism referred to is a process that moves from ignorance to knowledge, from immaturity to maturity [5]. So that various research and scientific innovations are needed to support the learning process.

Science learning is a learning that emphasizes the formation of skills to acquire knowledge and develop scientific attitudes. Innovative learning is a learning that utilizes the potential of students and learning resources contained in the lesson so that students are happy in carrying out learning activities. Innovative learning can be done in the process of learning science. Innovative science learning is done by providing a motivation, participation, and attitude related to science learning according to educational research. An innovative science learning process is to provide opportunities for students to build knowledge independently. By providing innovative science learning, it can result in an increase in the quality of good science learning (Nez, 2020 in Kompasiana). A lot of

innovative thinking for science learning, such as applying good learning concepts in accordance with the theoretical framework.

2.2 Development and Utilization of Learning Media

Learning media is a tool in the learning process both inside and outside the classroom, further explained that learning media is a component of learning resources or physical vehicles that contain instructional materials in the student environment that can stimulate students to learn [6]. Innovation of the learning process in the use of media Digital today has undergone several changes. The emergence of digital media is a solution in dealing with the Covid-19 problem that hinders the learning process. The conventional and monotonous learning process currently uses digital learning media that is more practical, efficient, innovative and flexible, and not limited by space and time. Digital learning media used by educators as alternative solutions for student learning are e-learning, YouTube, animated videos, and others.

E-learning as a digital learning media is a technology-based learning. The use of e-learning as a means of interaction between teachers and students provides convenience in learning activities. e-learning can shorten learning time and make study costs more economical. E-learning learning materials can be accessed systematically by students and teachers so that teachers can assess student progress. The materials used can be in the form of videos, files, and audio as well as electronic books.

Learning activities are more effective and efficient because students and teachers can access them anytime and anywhere. [7] defines e-learning as a form of conventional learning which is essentially presented through Information Technology and in digital format. E-learning must be created to resemble conventional education, as if students learn face-to-face, only changing in format, namely through the internet in a digital system. E-learning has a prominent advantage, with its ability to enable efficiency in the use of space and time. Education is now no longer dependent on space and time, thanks to e-learning.

Youtube is currently one of the best learning media. Because it is a learning resource for teachers and students that is easily accessible by displaying a variety of learning videos. YouTube media is increasingly expanding students' knowledge, because the media provides a variety of information needed. Youtube has the potential to be used as an alternative media for student learning [8]. The use of youtube as a learning medium is informative, meaning that youtube can provide information, including the development of science and technology that is currently happening and is cost effective, which means that youtube can be accessed for free via the internet network. Besides being useful for students, it is also useful for teachers and lecturers because it can be used as a teaching medium, to increase students' interest and motivation to learn so they are not easily bored and monotonous.

Animated video is a digital learning media to increase students' interest in learning and enthusiasm in the learning process, because it displays images that attract students' attention in the form of moving cartoon images with additional sound. Animated videos provide learning innovations for teachers and students, the purpose of animated videos is to attract students' interest in learning and can accelerate students' understanding of learning materials. The use of animated videos as a post-pandemic learning medium is

very effective because it can make it easier for students to explore material during online learning.

3 Conclusion

After the Covid-19 pandemic, of course, it really encourages educators to make learning innovations that can affect success in learning so that learning objectives can be achieved properly so that the change of learning methods from face-to-face to online learning in which there are learning innovations. It is not only the government that must play a role so that education in Indonesia can run well, of course it requires cooperation between teachers, students, and parents. The need for parental participation and increasing teacher skills or expertise in online learning so that educational innovation can be realized so that online learning is not a problem, but gets positive learning. With innovation in education in Indonesia, it is hoped that learning will continue to run effectively so that in the future it can still be applied so that education in Indonesia becomes more advanced.

References

1. Gilster, *Digital literacies: Policy, Pedagogy, and reasearch consideration for Education*. Sidney: James Cook University, 1997.
2. S. F. Romi Mesra, Abdul Rasyid Umaternate, "Application of the Learning Model 'Baca Dulu' Break Out Class Daring and Luring as an Effort to Overcome the Various Obstacles of Online Learning During The Covid-19 Pandemic at UNIMA Sociology Education Study Program," in *Proceeding ICHELSS 2021*, 2021, pp. 639–645. [Online]. Available: <http://journal.unj.ac.id/unj/index.php/hispisi/article/view/22394>
3. S. Susanti, "Meningkatkan Efektivitas Pendidikan Nonformal Dalam Pengembangan Kualitas Sumber Daya Manusia," *J. Handayani*, vol. 1, no. 2, pp. 9–19, 2014.
4. I. Wahyudi, *Pengembangan Pendidikan (Strategi Inovatif dan Kreatif Dalam Mengelola Pendidikan Secara Komprehensif)*. PT Prestasi, 2012.
5. N. Fitriani, C., Murniati, A., & Usman, "Kompetensi Profesional Guru Dalam Pengelolaan Pembelajaran di MTs Muhammadiyah Banda Aceh," *J. Adm. Pendidik. Progr. Pascasarj. Unsyiah*, vol. 5, no. 2, pp. 88–95, 2017, [Online]. Available: <http://jurnal.unsyiah.ac.id/JAP/article/view/8246>
6. A. Azhar, *Media Pembelajaran*. Depok: Raja Grafindo Persada, 2019.
7. D. D., *Pendidikan teknologi Informasi dan Komunikasi*. Bandung: PT. Remaja Rosdakarya, 2012.
8. R. Apriwahyuni, *Pemanfaatan Youtube Sebagai Media Pembelajaran. KEMENDIKBUD Ayo Guru Berbagi*. 2021.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

