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DIGITAL TRANSFORMATION IN SCIENCE EDUCATION

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Abstract. *Actually, the use of digital transformation in science education is not a new thing in education. This has been around for the past five to 4 years. However, education in Indonesia has only just become lively in using it because there was a proposal from the education minister who proclaimed to use digital transformation in the world of education. And even more lively in its use when the Covid-19 virus attacks the territory of the State of Indonesia. The policy of the minister of education in teaching and learning activities using distance learning. Either you can use the Zoom meeting application, Google Meeting, Google Classroom and so on. This is expected to increase teaching and learning activities throughout Indonesia such as activities carried out face-to-face. This is the new face of the world of education in Indonesia, all moving towards digital technology. The demands of the times that continue to move in accessing various information are likewise, inseparable from the advancement of digital technology. Dragging educators in using technology must also be able to. Both in use as a learning medium or a strategy in teaching and learning activities.*

Keywords: Digital Transformation, Teacher, Learning Media

A. INTRODUCTION

The development of human civilization that continues to advance is marked by changes in the pattern of human life from time to time with various unique treats and various alterations that lead humans to an easy and fast phase. This change then also penetrated all sectors of human life. Not apart from the education sector. Transformation in the world of education can be seen from changes in the education system, through curriculum, educational strategies, learning media, and even the educational process itself which keeps changing to adapt to the times and human needs.

Transformation is carried out in the world of education with the hope of responding to the challenges of an increasingly contemporary era. With various uses of digital technology in the process of teaching and learning activities that are not only done face-to-face, but can be done online.

Mezirow's opinion in Arif Unwanullah explains the concept of transformation as follows: ... "the concept of transformative learning which he defines as "the process by which we transform our taken forgranted frames of reference"). Then it is further said that He asserts that transformation takes place through a process of critical reflection that is facilitated by open dialogue in a safe setting. In conjunction with this reflection and dialogue, Transformation Theory"s focus is on how we learn to negotiate and act on our own purposes, values, feelings, and meanings rather than those we have uncritically assimilated from others Mezirow". It can be understood that the concept of transformative learning is defined as the process in which we change the frame of reference. He emphasized that the transformation took place through a process of critical reflection facilitated by open dialogue in a safe atmosphere. In relation to

reflection and dialogue, the focus of transformation theory is on how we learn to negotiate and act on our own goals, values, feelings, and critical meanings that we assimilate from and on others (Suci & Irjus Indrawan, 2020).

This theory is more inclined towards the philosophy of existentialism which seeks to initiate the concept of man and the intricacies of the problems that surround it. This flow of education challenges the establishment of education which is considered stagnant without giving meaning and significant changes to the reality faced by humans.

Talking about teachers according to the Big Indonesian Dictionary, as explained by Mujtahid in his book entitled "Teacher Professional Development", the definition of a teacher is a person whose job, livelihood, or profession is teaching (Mujtahid, 2011). Sri Minarti quoted the opinion of the Dutch linguist, J.E.C. Gericke and T. Roorda, who explained that the teacher comes from Sanskrit which means heavy, big, important, very good, good, and teacher. While in English we find several words that mean teacher, for example teacher which means teacher or teacher, Educator which means educator or expert in educating, and tutor which means personal teacher, teacher who teaches at home, or teacher who teaches tutoring (Sri Minarti, 2013).

Meanwhile, Supardi in his book entitled "Teacher Performance" quoted by Perdana explained the definition of a teacher according to the Law of the Republic of Indonesia Number 14 of 2005 concerning Teachers and Lecturers, that teachers are professional educators with the main task of educating, teaching, guiding, directing, training, assessing, and evaluating students in early childhood education, basic education, and secondary education through formal education (Perdana, 2018).

The origin of the word media is from Latin, namely *medius* which literally means middle, introduction or intermediary. Gerlach & Ely said that the media, if understood in broad terms, are materials, people, or events that can build conditions that enable students to gain skills, knowledge, and attitudes. In this sense the media includes, textbooks, teachers or educators, and also the school environment. Specifically, in the learning process, the notion of media can also be interpreted as graphic, photographic, or electronic tools to process, retrieve, and reconstruct visual or verbal information (Azhar Arsyad, 2017).

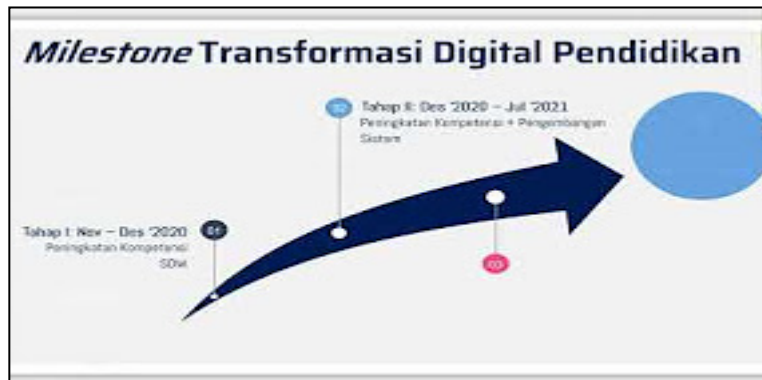
Online media is a new type of journalism media that has a myriad of features and characteristics from traditional journalism. Some of the unique features of its technology provide seamless possibilities for obtaining, disseminating, and processing information. Online media accelerates the dissemination of information and obtains information in the form of internet social media such as Google, Whatsapp, Google Classroom, Zoom, etc. (Septiawan, 2005).

B. METHODS

This study aims to find out how the transformation and digitalization of the education sector during the pandemic. This research is a qualitative research with descriptive analysis techniques with library research, namely in the data collection process, various references are taken from the supporting literature and do not need to go into the field. This type of research is qualitative research. Data collection techniques are listening and recording important information in conducting data analysis by reducing data, displaying data and drawing conclusions so as to get a complete picture of conclusions regarding the study of literature to be developed in this study and for data validation using triangulation of data sources.

C. RESULT AND DISCUSSION

In general, the notion of digital transformation can be interpreted as a radical process that occurs in an organization that utilizes human resources and technology that causes the organization to change drastically. As previously mentioned, digital transformation can be interpreted as a process using available digital technology such as virtualization technology, mobile computers and clouds that are integrated with other media (J. Loonam, 2018). In addition, digital transformation is defined as a change in all sectors by using information technology to gain efficiency and effectiveness.



Gambar 1. Digital Transformation

1. Teacher Readiness in Digital Transformation of Education

Responding to educational challenges regarding teacher readiness to face technological developments as much as possible accompanied by solutions to overcome existing problems. The world of education is now starting to get busy to prepare a generation that is able to survive in the competition. Readiness in question is the ability to use technology so that they are able to assist and teach students by utilizing technology. Having technological skills must also be accompanied by an understanding that technology can be used to obtain positive learning outcomes (Fitriah & Mirianda, 2019).

Using digital transformation because of the ability of educators to use technology is one solution to prepare a competent millennial generation. This is certainly in line with the opinion of the Minister of Research and Technology regarding the preparation of responsive, adaptive and reliable human resources to face the industrial revolution.

The teacher's task is of course to optimize all students' abilities with a variety of fun learning methods and in accordance with the stages of child development, thus providing opportunities for students to be creative, solve problems, optimize literacy and numeracy skills, collaborate, and think critically.

So at least the teacher has been prepared on several items, namely:

- Provide understanding or knowledge to all educators to be able to use technology in learning, guide students in using technology and facilitate the implementation of education throughout Indonesia.
- Provide continuous training, mentoring, and evaluation to educators to create responsive, reliable, and adaptive educators.
- Prepare educators to be able to create innovative learning, so as to provide opportunities for children to be creative, solve problems, optimize literacy, collaboration, and critical thinking skills.

Shifting the way of learning that already exists in Indonesia with various models and learning media.



Gambar 2. 21st Century Learning

2. Learning Media

Learning media is an important element in the learning process. Learning media is a learning resource that can assist teachers in enriching students' insights, with various types of learning media by teachers, they can be used as material in providing knowledge to students. The use of learning media can foster student interest in learning new things in the learning material presented by the teacher so that it can be easily understood. Interesting learning media for students can be a stimulus for students in the learning process. Management of learning aids is very much needed in formal educational institutions. Learning media can be used as a tool in teaching and learning activities. As a teacher, you must be able to choose appropriate and suitable learning media to achieve the teaching goals set by the school (Dwijayani, 2019).

The use of digital technology has a role in supporting and improving students' cognitive processes and thinking skills. One example of digital technology is the internet. The internet can allow teachers to present lessons more interestingly for students. Currently, internet-based learning, such as web-learning, e-learning or online learning (distance learning) has been widely practiced. These lessons use the internet as a medium. In addition to learning to be more flexible in terms of time, place and age, students can also access the information needed in learning freely. Because learning becomes more individualized, this can improve students' cognitive processes and thinking skills.

Learning media is as a teaching aid, namely supporting the use of teaching methods used by teachers. Meanwhile, according to Azhar Arsyad, learning media are everything that can be used to convey messages or information in the teaching and learning process so that it can stimulate students' attention and interest in learning. So it can be concluded that what is meant by learning media is a tool that can help the teaching and learning process so that the meaning of the message conveyed becomes clearer and the goals of education or learning can be achieved effectively and efficiently. Another example of the use of technology as a learning medium is radio, television, and video which can be used to facilitate the learning styles of different students and also attract students to be more motivated in learning. The use of interactive presentation devices such as electronic whiteboards can make learning materials more interesting for students (Lestari, 2018).

D. CONCLUSION

Education in the era of globalization means the integration of national education into world education. Students must be equipped with adequate competencies so that students exist in a highly competitive global era. There are several problems and challenges faced by the world of education in the era of globalization, including the quality of education, professionalism of educational staff, culture (acculturation), learning strategies, challenges to management improvement, and challenges to advances in science and technology.

Technology in education is a system that is used to support learning so that the desired results are achieved. The implementation of technology in education in Indonesia is that technology can be used as a learning media, administrative tool, and learning resource.

The impact of technology in education in Indonesia, apart from having a positive impact, also has a negative impact. The positive impact is more efficient in terms of time, costs, logistics and other institutional problems. While the negative impact is that technology can change social life.

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