

Utilization of ICT-based Learning Media: Differentiated learning in SDGs

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Article Info

Article history:

Received Jan 31, 2024
Revised Apr 18, 2024
Accepted Apr 28, 2024

Keywords:

Language education
SDGs
ICT-based Learning
Learning Media

ABSTRACT

This research is motivated by the need for ICT (Information and Communication Technology) based learning media that should be taken seriously in learning. In addition, it is sustainable with the orientation of the SDGs (Sustainable Development Goals) in education, namely Goal 4: Quality education - Ensure appropriate and inclusive quality education and encourage lifelong learning opportunities for all people, and promote education for sustainable development. The purpose of this research is to analyze how the utilization of media in learning, the fulfilment of learning media according to the needs of students with differentiated SDGs (Sustainable Development Goals) with ICT-based learning media (Information and Communication Technology), and analysis of problem solving that will be met by alternative solutions in learning media literature. This research uses a qualitative approach with descriptive methods. Data collection was conducted using purposive sampling technique by determining the sample based on certain considerations. The sample in this study was 144 students from various levels spread across Greater Bogor. Based on the results of the research that has been conducted, it can be described that Information and communication technology in learning has not been fully utilized by teachers. This has an impact on the work produced by students through media utilization. The utilization of learning media based on information and communication technology (ICT) fosters the active role of students in working on learning. It can be concluded that using ICT-based learning media could lead the students to optimize their learning outcome, skills through differentiated learning pertaining to SDGs.

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Introduction

Education is a concrete step in educating the nation's generation to become advanced, critical, innovative, creative, and superior human resources in scientific disciplines and character. Education is a place to form a good image in human beings in order to develop all their potential. Law number 20 of 2003 concerning the National Education System has also explained that education is a place or place to develop all the potential that exists in

humans. Therefore, in this case in general that education is not limited to certain subject matter only. Rather, it includes all aspects related to human potential in terms of development. (Bruni, 2016)

Advances in science and technology have a huge influence in various fields of human life. Education as an inseparable part of the human maturation process certainly on the one hand has a big contribution to the development of science and technology, but on the other hand education also needs to utilize advances in science and technology in order to achieve its goals effectively and efficiently. For this reason, it is necessary to develop various creative and innovative learning models and media. This needs to be done so that the learning process does not seem less interesting, monotonous and boring so that it will hinder the transfer of knowledge. Therefore, the role of media in the learning process is important because it will make the learning process more varied and not boring. (Muhson, 2010; Luma & Nurhayati, 2023)

Advances in science and technology have affected the use of teaching aids in schools and other educational institutions. Nowadays, learning in schools has begun to be adapted to the development of information technology, resulting in changes and shifts in the educational paradigm (Hujair, 2009; Priyanto, 2009). This indicates that the use of information technology in the learning process has become a necessity as well as a demand in this global era.

The development of Information and Communication Technology (ICT) in the last few decades has been very fast in line with the development of telecommunications technology, including computer networks. Various supporting technologies and applications have also been developed in an effort to support and facilitate human and organizational life activities, including teaching and learning activities in the world of education (As' ad & Abdullah, 2022).

The utilization of technology in learning requires that the means, creativity, and abilities of students and teachers are measured. Learning using technology is assumed to be more efficient, the level of creativity increases, and the understanding of teaching materials becomes broader. This is because technology helps stimulate students to search for renewable literature more easily (Bingimlas, 2009; Anwariningsih & Ernawati, 2013).

Learning media is a tool that can help the teaching and learning process so that the messages conveyed become clearer and educational and learning objectives are achieved effectively and efficiently. In addition, learning media functions as a learning resource for students to obtain messages and information provided by the teacher, so that learning materials can increase and form knowledge for students. The benefits of learning media, first, provide guidelines for teachers to achieve learning objectives so that they can explain learning material in a systematic order and assist in the presentation of interesting material to improve the quality of learning; second, can increase student motivation and interest in learning so that students can think and analyze the subject matter provided by the teacher well with a pleasant learning situation and students can understand the subject matter easily. (Nurrita, 2018; Suryani, 2015; Amalia., 2018)

Media is an important factor in learning activities. Through the media the teacher can be helped in delivering the material. Learning activities become more alive with the media. Students also benefit from the media used, but a medium does not necessarily reach all students. The limitation of trainers or modules used as learning media is one of the obstacles. Another thing that is also an obstacle is the characteristics and abilities of students who vary in absorbing the material presented. (Mustaqim & Kurniawan, 2018; Gamar & Tati, 2021)

As a support for learning needs that are oriented towards the use and utilization of media; this research examines how media utilization in learning, whether the fulfillment of learning media is in accordance with the needs of differentiated students SDGs (Sustainable Development Goals) on "Goal 4: Quality education - Ensure appropriate and inclusive quality education and encourage lifelong learning opportunities for all, and promote education for sustainable development".

Through the utilization of technology as an attractive literacy for students, it is expected that learning is in accordance with Goal 4. In addition, media rooted in Information and Communication Technologies (ICT) are expected to bring meaningful changes in the creation and innovation of learning by teachers and students in order to be internationally competitive.

The problem that arises in learning is generally conventional teacher-centered learning in the classroom. This is no longer in line with the progress of education that prioritizes the use and utilization of technology in learning, because by utilizing technology, the opportunity to be educated for sustainable development becomes clearer so as not to be left behind in a particular era. The use of technology in orientation in differentiated learning as contained in the Independent Curriculum. Differentiated learning can be differentiated in content, process and product. ICT-based learning is a form of differentiated learning on products.

The approach taken to the problem of these needs in this research plan is to explore the shortcomings and potential of appropriate technology in learning that suits the needs. This is done in an effort to fulfill technological needs in learning, such as in making learning media, utilizing gadgets or computer devices in making them, the effectiveness of learning time, and increasing student understanding.

Method

This research aims to examine, study, and gain a deeper understanding of the editing process of all linguistic aspects in scientific papers published by journal publishers. The setting of this research includes three things, namely places, actors, and activities. (Endraswara, 2003). The place in question is schools scattered in Greater Bogor.

This research uses a qualitative approach with descriptive methods. Qualitative descriptive method is a research method based on the philosophy of post-positivism used to research on natural object conditions (as opposed to experiments) where the researcher is the key instrument. Data collection techniques are triangulated (combined), data analysis is inductive / qualitative, and qualitative research results emphasize meaning rather than generalization. Primary data in this study are questionnaires distributed to students at elementary, junior high, and high school levels spread across Bogor. According to Sugiyono, (2016) suggests that a questionnaire is a data collection technique that is done by giving a set of questions or written statements to respondents to answer.

Qualitative descriptive research aims to describe, describe, explain, explain and answer in more detail the problems to be studied by studying objects. In qualitative research, humans are research instruments and the results of the writing are in the form of words or statements that are in accordance with the actual situation (Sugiyono, 2016). The choice of descriptive method is based on in-depth curiosity about meeting the needs and utilization of technology used by teachers in learning in Greater Bogor.

The population and samples taken in this study were students. The determination of the sample has been determined in advance, so that research with the aim of analyzing the

fulfillment of needs and the use of technology used by teachers in learning can be carried out smoothly, and bring up the formulation of alternative solutions to these needs. The sample in this study was 144 students from various levels spread across Greater Bogor.

Results and Discussion

The benefits of learning media, first, provide guidelines for teachers to achieve learning objectives so that they can explain learning material in a systematic order and assist in the presentation of interesting material to improve the quality of learning; second, can increase student motivation and interest in learning so that students can think and analyze the subject matter provided by the teacher well with a pleasant learning environment and students can understand the learning (Nurrita, 2018).

Based on the needs of students in learning, the fulfillment of information technology needs is very important. This need makes the research team conduct research with the aim of analyzing the use of media in learning, fulfilling learning media according to the needs of students who are differentiated from SDGs (*Sustainable Development Goals*) with learning media that are already based on ICT (*Information and Communication Technology*), and analyzing problem solving that will be met by alternative solutions in learning media literature.

The research conducted obtained results from the distribution of questionnaires given to students in Greater Bogor and then analyzed according to the research objectives to analyze how the use of media in learning, the fulfillment of learning media according to the needs of students with differentiated SDGs (*Sustainable Development Goals*) with ICT- based learning media (*Information and Communication Technology*), and analysis of problem solving that will be met by alternative solutions in learning media literature. The data obtained the following results.

Table 1. Respondent level

Level	Total	Percent
Elementary School	2	1,4%
Junior High School	72	50%
Senior High School	70	48,6%

Table 2. Question Recapitulation

Question		Answer			
		Always	Often	Sometimes	Never
Teachers use learning media in teaching	Total	57	40	46	1
	(%)	39,6	27,8	31,9	0,7
Teachers use various learning media	Total	49	47	46	2
	(%)	34	32,6	31,9	1,4
every teacher uses learning media other than books	Total	24	57	62	1
	(%)	16,7	39,6	43,1	0,7
teachers use learning media that are not in accordance with the subject matter	Total	4	9	40	91
	(%)	2,8	6,3	27,8	63,2
It is easier for me to understand the lesson after the teacher uses learning media	Total	53	46	43	2
	(%)	36,8	31,9	29,9	1,4
The use of learning media has a big influence in understanding the lessons I follow	Total	64	50	29	1
	(%)	44,4	34,7	20,1	0,7
I am more eager to follow lessons that use learning media	Total	67	38	37	2
	(%)	46,5	26,4	25,7	1,4

Question	Answer				
	Always	Often	Sometimes	Never	
does the use of learning media that the teacher provides help me in creating learning outcomes?	Total	73	45	25	1
	(%)	50,7	31,3	17,4	0,7

In addition, the fulfillment of ICT (*Information and Communication Technology*) based learning media needs has an impact on students as a stimulation to encourage students to work, and the use of media that is often used by teachers in learning is illustrated in the following graph

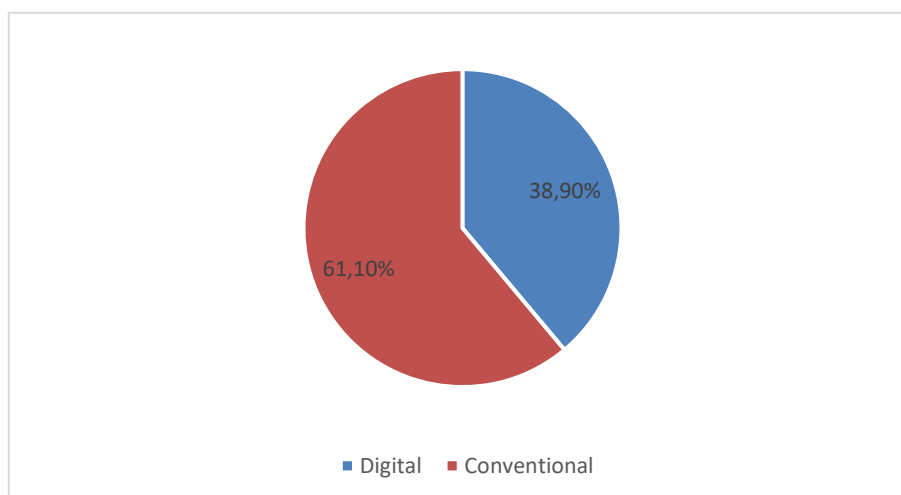


Figure 1. Types of Media Applied in Learning

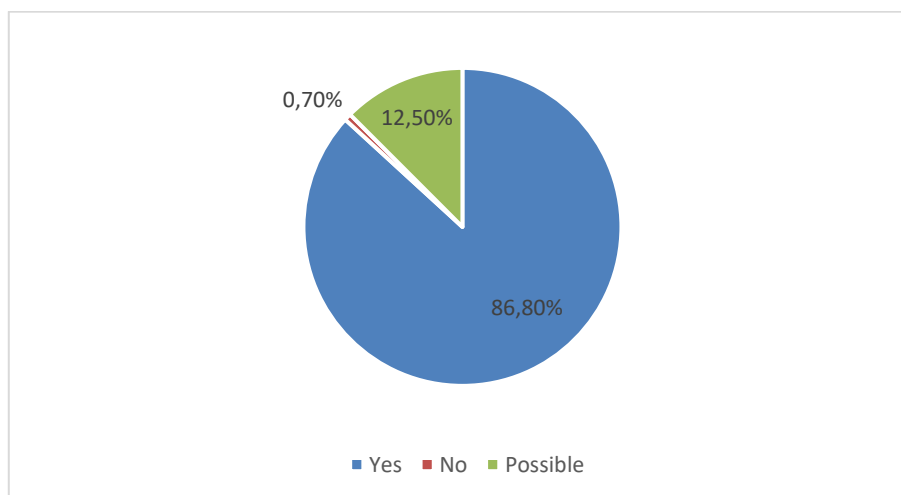


Figure 2. The Use of Learning Media is Useful in Understanding and Creating Learning Works

Based on the explanation above, it can be concluded that the use of media for learning is beneficial for students. This can be explained by data on the use of learning media useful in understanding and creating learning works as learning goals, namely 125 students or 86.8% stated that it was useful, 18 students or 12.5% and the use of learning media by digital / ICT-based teachers showed 56 students or 38.9% answered that the teacher used digital media. It can be concluded that the utilization of ICT-based learning media shows a positive answer average.

The use of ICT in learning has a big influence in improving the quality and quality of education. This is in line with Eiji & Gin (2021) and Husnaini (2014) research which states that the development of information technology makes it easier to communicate, exchange information so that place, time and distance are no longer obstacles. The rapid development of information technology cannot be separated from the development of computer engineering. Advances in the field of computers and information technology also have a positive impact on the field of education. The most influential application in the field of computer technology and information technology in the field of education is the use of computer networks and the internet. With the internet, information services for target students are not limited by space, place, time and distance. Through the internet, information services can be provided as learning resources, learning media that can be studied according to students' learning speed. Learning media is not limited to letters and pictures but can be combined with graphics, animation, video, audio together so that this media is better known as multimedia. The positive influence of using the internet for education in building human resources in the world of education must be able to keep up with developments in science and technology applications.

According to Astini (2019), Hidayah, *et.al.* (2020), starts from the challenges and opportunities of the 4.0 era which must be used by educational units to start adapting to various changes, so that they are ready to serve students from the millennial generation in terms of pedagogy, digital skills, basic literacy, technological literacy, human literacy, strengthening character education and life skills. Developing a learning framework in the 21st century that requires students to have skills, knowledge and abilities in the fields of technology, media and information, learning and innovation skills as well as life and career skills.

The Research that has been done by Mustaqim & Kurniawan (2018), Yusuf, *et.al.* (2021) revealed that a good learning process must contain interactive, fun, challenging, motivating aspects and provide more space for students to be able to develop. creativity and independence, according to students' talents and interests. Interesting learning media is also very necessary for vocational school students, because vocational school learning prioritizes practicum rather than theory. It is necessary to consider when selecting media, namely learning objectives, effective, easy to obtain, students, use, not rigid, cost, and quality.

Head of the Center for Educational and Cultural Information and Communication Technology (Pustekkom) of the Ministry of Education and Culture (Kemendikbud) said that currently, of the total teachers in Indonesia, only 40% are literate with information and communication technology (ICT). The remaining 60% percent of teachers are still confused about progress in this digital era. There are three main causes, namely (1) the competence of teachers in Indonesia is very low in the world of ICT, 30 percent of those in Indonesia are over 45 years old, and are even about to retire. (2) educational technology content is still minimal and (3). There needs to be adequate facilities and infrastructure in the regions (Astini, 2019). Therefore, the importance of using ICT in learning that involves students and teachers should be in line with government policy, and the government should provide encouragement and effort to make this happen.

Conclusion

Based on the results of the research that has been conducted, it can be concluded that there are several things related to the utilization of information and communication

technology (ICT) in learning for students in Greater Bogor, namely this: Information and communication technology in learning has not been fully utilized by teachers. This has an impact on the work produced by students through media utilization. In addition, the use of technology and digitalization in learning is still limited and not used as a new learning system strategy that reintegrates with the learning process; The utilization of learning media based on information and communication technology (ICT) fosters the active role of students in working on learning according to the differentiated research objectives of Sustainable Development Goals (SDGs).

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