Utilizing Multimedia Technology in Digital Learning Content Development

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Abstract— **The development of information and communication technology is growing rapidly. Many positive impacts are obtained, especially in the field of education. Teachers and students find it easy to do the learning process in the classroom. If they use technology in digital learning. Access to new knowledge, information from various parts of the world, learning methods that suit student needs, and others can be reached with just one tap of the finger. It is so easy to compete in this globalization era. One of them is by utilizing multimedia technology in the development of digital learning content, so that if utilized optimally, it will get great benefits. The results of content creation are more interesting and favored by the audience. The purpose of this research is to facilitate the development of digital learning content by utilizing multimedia technology as much as possible, so that learning objectives for students can be achieved properly and optimally. For example, by creating educational content about one of the learning materials on YouTube which contains direct explanation by the teacher in an interesting place. And the content is supported by features that are interesting and not boring. The method used in this research is quantitative method. Data obtained through distributing questionnaires to students. The questionnaire was created by utilizing Google form. The results of this study explain that utilizing multimedia technology properly in creating digital learning content will provide benefits for teachers and students in the learning process. The conclusion of this study is that the utilization of multimedia technology has a positive influence and provides space for teachers to provide digital learning content easily and creatively. The limitation of this study is that researchers only conducted research at the school or madrasa level which in fact requires the use of multimedia technology in learning.**

Keywords— **Development, Utilizing, Multimedia**
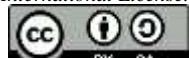
I. INTRODUCTION

Increasingly advanced technology can be utilized in many areas of life (Wangge, 2020). Technological advances in the field of education require the use of various learning media and increasingly sophisticated equipment. It can be said that the world of education today lives in the world of digital media (Astuti et al., 2023). It is inevitable, it must even keep up with existing developments, so that education is increasingly advanced to produce quality successors to the nation. (Nauman et al., 2020). Learning activities began to shift from the system of delivering teaching materials using the lecture method and replaced it with the use of multimedia. Conventional learning methods that are still monotonous are replaced with interactive learning methods based on digital technology that are more flexible. (Mutlu-Bayraktar et al., 2019). In learning activities that emphasize competencies related to process skills, the role of learning media becomes necessary (Dwiqi et al., 2020). Educators in this modern era are required to be able to utilize technology to teach in class, so that students can get knowledge easily and of course fun. Students' healthy competitiveness to be better will appear by itself, they will compete to be the best. (Maulani et al., 2022). So if like that it will make diligent learning and try new things that will hone their potential.

Well-designed, creative and innovative learning by utilizing multimedia, within certain limits will be able to increase the possibility of students to learn more, understand what they are learning, increase students' ability to follow competencies that are a priority in today's world of education. (Mayer, 2019). Students will also be able to think critically about the problems they face. Learning that applies in this century is no longer students waiting for material from the teacher, but students find out for themselves easily from several trusted sources (Vagg et al., 2020). Students will be creative by utilizing the sophistication offered by multimedia technology. That way the opportunity to

be famous and reveal themselves to everyone will be easy. (Sungkono et al., 2022), and will make the school proud with outstanding achievements. Students will also make their parents proud who have worked hard to provide for their educational needs, so good relationships will be established. The direction of innovative education is to carry out the teaching and learning process using technology. (Vaganova et al., 2020). However, this potential is less supported by the authority and the school in optimizing the use of computer-based learning media. (W. N. Putri & Billah, 2019). It is very unfortunate if the school is unable to keep up with the times, because the school's golden opportunity to compete and compete will be wider.

Quality education will certainly create quality student learning as well (Kumari et al., 2020). Computer-based education is intended to be a learning model or product that is intentionally designed and developed using a computer as a base to facilitate the learning process (Rofiatun Nisa' & Eli Fatmawati, 2020). Currently, there are still many problems in classroom learning. Some teachers have not maximally used and developed computer-based learning media in teaching and learning activities. (Budiman et al., 2022). Sometimes there are still many teachers who have not maximized the use of learning tools in the form of this multimedia technology. (Zahwa & Syafi'i, 2022). Educators do not want to use it because they still think that the old methods can be used well, but most teachers are aware of the importance of utilizing multimedia technology as a teaching tool. The multimedia referred to in this paper does not mean merely a variety of media but requires or identifies multimedia computers that are developed properly to be developed in learning. This utilization is felt to only take place in favorite schools that have complete infrastructure and are also supported by qualified teachers. (Yayan Alpian et al., 2019). In fact, the use of multimedia can be utilized by anyone and anywhere without any restrictions. Even rural schools can utilize this

powerful technology to compete at the national level with elite schools. (Dosi, 1982). Awareness needs to be fostered first about the importance of using multimedia in this era. After that, socialization on the use of multimedia technology is given. In order to be able to use it properly.

The development of content in learning is very important, for the implementation of a conducive and enjoyable teaching and learning process for students in the classroom. (Mustafiyanti et al., 2023). So that learning objectives can be achieved optimally. Through multimedia which is a computer-based interactive communication system that is able to create, store, present and re-access information in the form of text, graphics, sound, video or animation. (Wahyudiati, 2022). The multimedia components that need to be prepared to develop can be grouped as follows visual materials, audio materials, and games and simulations. (Tri Wahyuni et al., 2021). Media from visual materials do not require a projector to view. Therefore, this type of media is relatively widely used by teachers. It is certainly expected to be more advanced and developed with the utilization of this multimedia by educators (Hayaty et al., 2021). Creative students can also create learning content which is a task given by the teacher. So that's how complex the education undertaken by students is. Making education perfect with ideal cooperation. Not only teachers who are able to create, but students can also be innovative (Hamidi et al., 2011). In fact, the content can be traded if it meets the conditions imposed, not arbitrarily. The courage to compete healthily with anyone is also high. Efforts to develop well will be maximized by students, because so that their wishes are achieved. To realize the hope of a prosperous and prosperous future, of course, it must be balanced with hard work in the current period. It is also better to work smart by utilizing the ease of technology that is mutahir in this era. Nothing can prevent a good desire to continue to develop, except for the laziness that continues to be maintained every day. The motivation that needs to be believed is to encourage oneself to evaluate, in order to continue to correct the mistakes made. To not be repeated.

Learning media development should fulfill the principle of visuals (visble, interesting, simple, useful, accurate, legitimate, structured). The use of multimedia technology will certainly make it easier for teachers to interact in the local and can maximize the provision of knowledge to students. Multimedia is one of the many factors that have the greatest influence on growth, psychological development and behavioral changes at all ages, especially children (Hayaty et al., 2021). Responding to the influence of multimedia technology on child development, educators must know in advance about the substance of multimedia technology and be able to be part of them (Budy Satria et al., 2022). That is, not stuttering technology and step by step can minimize its negative impact. The way that can make the negative impact smaller is by providing education on the importance of using technology wisely, not looking at things that are prohibited and used. (N. A. Putri et al., 2023). The rapid development of science and technology requires teachers to be able to innovate in the learning process and leave the old way to go to a new, more modern and innovative way of teaching activities through the use of technology that is growing rapidly in this day and age. (Syamsuar & Reflianto, 2019), so that the learning process will be more interesting, motivating, and able to create higher quality learning and create graduates who are competent and highly competitive. The school's reputation will also increase with the results of the hard work between teachers and students.

The student learning process is greatly influenced by the quality of the teacher. (Safitri et al., 2022). Teachers are the main component that has a central role in the success of education. The rapid development of science and technology requires teachers to be able to innovate in the learning process and leave the old way to go to a new, more modern way. (Elitasari, 2022), and innovative in teaching activities through the use of

multimedia technology in creating learning content in the classroom. Students who have high creativity will be able to create interesting and innovative content to realize the expected learning. (Mustafiyanti et al., 2023). The teacher can also recognize and make it an additional value for the student. In this day and age it is actually easy to be able to develop well, but the sense of laziness and procrastination to do so (Utami et al., 2023). And awareness of the importance of technology is still lacking. There is a need for seminars, workshops and training to create quality human beings (Saskia et al., 2023). The curiosity in a person will lead him to his curiosity and eventually find a way to get it. With hard work and cooperation, of course (Liam et al., 2023). Learning strategies also need to be considered to support the use of multimedia technology for the creation of appropriate content.

According to (Budiyono, 2020), stated in his research entitled innovation in the use of multimedia technology in learning in the era of revolution 4.0, which aims to examine the technique of utilizing multimedia technology as a learning medium and educator innovation in overcoming problems in teaching knowledge in the classroom. Furthermore, according to (Novitasari, 2019), stated in his research entitled the use of multimedia technology in early childhood literacy learning, the aim is to describe the use of multimedia technology in early childhood learning, including the implementation of the use of multimedia technology in literacy learning for children aged 5-6 years. According to (Lestari & Wirasty, 2019), stated in his research entitled utilization in interactive media learning to increase student interest in learning, aiming to make the most of multimedia technology in order to increase student interest in learning by creating interactive learning media. According to (Handoko & Novitasari, 2019), stated in his research entitled multisensory models based on multimedia technology for early childhood learning, aiming to develop a teaching model that can be used by

parents at home, to stimulate children's literacy development.

Researchers seek to maximize the use of multimedia technology to create interesting digital content. So that students' needs for learning and knowledge are met in a creative and innovative way by teachers. The purpose of this study is to maximize the use of multimedia technology to improve classroom learning, to make it more conducive and create a brilliant generation that is competitive. As well as having high quality competitiveness. Critical thinking when faced with challenges that require moving forward through it tough and ready to fight. The satisfaction obtained by several parties who work together to realize the desire to advance towards education will be great. This is a spur to fight with high spirits. Not only that, there are many educational benefits that can be obtained if you are able to utilize this multimedia technology to the fullest.

II. RESEARCH METHODS

The method in this study uses quantitative methods. The definition of quantitative methods is research based on empirical experience that collects data in the form of numbers that can be counted and are numerical in nature. (D. Firmansyah & Dede, 2022). Or it can also be interpreted as a process of finding knowledge that uses data in the form of numbers as a means of analyzing information about what you want to know in a real and authentic way. The characteristic of quantitative research is to use a deductive thinking pattern, which seeks to understand a phenomenon by using general concepts to explain specific phenomena. (M. Firmansyah et al., 2021). Furthermore, the logic used is positivistic logic and avoids things that are subjective. The research process follows a planned procedure. The purpose of quantitative research is to compile nomothetic science, which is science that seeks to make laws from generalizations. The subjects studied, the data collected, and the data sources needed, as well as the data collection tools used are in accordance with what has been planned

previously. Data collection is done through measurement using objective and standardized tools. Involves calculating numbers or quantifying data and researchers place themselves separately from the object of research. Data analysis is carried out after all data is collected.

Quantitative research in analyzing data, researchers are required to understand statistical techniques. Research results in the form of generalizations and predictions, regardless of the context of time and situation. This research in its implementation is based on pre-planned procedures. The steps of quantitative research are problem formulation, which is a question about an empirical object that has clear boundaries and can be identified by the factors involved in it. (M. Firmansyah et al., 2021). The preparation of a framework of thinking in the preparation of hypotheses which are arguments that explain the relationships that may exist between various factors that are interrelated and form a constellation of problems. (Sari et al., 2022). This framework is arranged rationally based on scientific premises that have been tested by taking into account empirical factors relevant to the problem. Formulation of hypotheses which are temporary answers or conjectures to the questions posed whose material is the conclusion of the developed framework. Hypothesis testing which is the collection of facts relevant to the hypothesis proposed to show whether there are facts that support the hypothesis or not. Drawing conclusions which is an assessment of whether the proposed hypothesis is rejected or accepted.

Quantitative research is an approach that presents using numbers that are analyzed statistically. The collection method uses population and sample. Population is a collection of research objects. If the sample is the object of research to be carried out. Population can be defined as the total number of units or individuals whose characteristics are to be studied. The unit in this term refers to the unit of analysis. It can be in the form of people, objects, institutions, institutions, and others. While

sample in a simple sense is a small part of the research object chosen by the researcher. So that from the entire research object called the population term, a few are taken, the object taken is called a sample. Quantitative research is equipped with statistical tests, namely in the form of inferential statistical tests used when the data collection technique is random and when the required sample is clear. There is also descriptive which is used to analyze data by drawing or describing the data that has been collected without changing the data source obtained.

III. RESULT DISCUSION

This research is the utilization of multimedia technology for the development of digital learning content. Multimedia is defined as a form of transmission of text, audio and graphics in the same period, interpreted as a computer-based interactive communication system that is able to create, store, present and re-access information in the form of text, graphics, sound, video and animation, allowing storing, processing and presenting in digital format. Teachers in developing learning media should meet the criteria, namely in accordance with the needs of children's age, appropriate in the selection of colors and designs, and interactive media in responding to stimuli displayed on the computer monitor layer. The development of learning media in the form of digital content in the world of education is still minimal, even though the impact of the utilization of multimedia is very large. So there needs to be awareness of the importance of this technology.

This research uses quantitative methods. Quantitative methods are part of a systematic investigation of phenomena by collecting data to be measured by mathematical or computational statistical techniques. The quantitative data collection process is known as questionnaire, interview and observation data collection techniques. Research in the form of numerical and countable numbers is also called quantitative research. Quantitative research methods are obtained through a questionnaire as a research tool

or can use a questionnaire. Research according to Wiratna Sujarweni is a type of research that produces findings that can be achieved using statistical procedures or other means of quantification. Quantitative methods are divided into two, namely inferential methods and descriptive methods. One example of quantitative research is the utilization of multimedia technology in the development of digital learning content.

This quantitative method is a systematic scientific research on parts and causal phenomena of their relationships to develop and use mathematical models, theories and hypotheses related to events or phenomena. The advantage of this quantitative data analysis is that the data can be interpreted with statistical analysis. Based on mathematical principles, so the quantitative approach is seen as objective and rational. Data collection techniques can be through interviews, questionnaires and observations. This quantitative research helps in determining the relationship between variables in a population. It also helps determine the research design. Talking about quantitative research design, it has two forms, namely descriptive studies and experimental studies. This quantitative research presents data on the maximum utilization of multimedia technology in the development of digital learning content. The following are the results of distributing questionnaires and statements about the effectiveness of using this strategy.

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
Utilization of multimedia technology in creating digital learning content has many positive impacts	55%	60%	0%	0%
Digital learning in the classroom becomes more fun by using content	65%	49%	0%	0%
Students become interested in learning using multimedia technology	40%	60%	4%	0%
Teachers are more creative in classroom learning	35%	70%	0%	0%
Multimedia technology can improve students' skills to be creative	45%	80%	0%	0%
Technology utilization is very easy to implement	30%	60%	0%	0%
Digital learning materials become more interesting with the support of diverse content and features	40%	70%	4%	0%
Learning objectives are well achieved if we can maximize the use of this technology.	50%	45%	3%	0%
Various competitions will be able	65%	45%	0%	0%

to be followed by students				
Make students creative and innovative in learning	55%	50%	0%	0%
Ease will be obtained by maximizing the use of digital content	60%	40%	0%	0%
Increase school achievement so that it becomes famous and prestigious	70%	30%	0%	0%
Motivate students to try new things easily	65%	60%	0%	0%
Digital learning content will certainly develop with the cooperation with several parties	25%	70%	5%	0%
Community support is needed to develop this learning content	25%	60%	0%	0%

In the table above, there are several statements from several questions in the utilization of multimedia technology studied by researchers in schools/madrasas. The statements generated from several questions greatly assist researchers in examining the utilization of the use of multimedia technology in the development of digital learning content. The questions asked were 15 questions containing a number of statements regarding the utilization of multimedia technology in digital learning content. The statement containing that the utilization of multimedia technology in the creation of digital learning content has many positive impacts, getting a percentage of 55% in the strongly agree category. While in the agree category, it gets a percentage of 60%, in the disagree category, it gets a percentage of 0%, as well as the strongly disagree category gets a percentage of 0%. The statement that digital learning in class becomes more fun by using multimedia technology, get a percentage of 65% in the strongly agree category. While in the agree category, the percentage is 49%, in the disagree category, the percentage is 0% and the strongly disagree category gets a percentage of 0%.

Furthermore, the statement that students become interested in learning by using multimedia technology, received a percentage of 40% in the strongly agree category. While in the agree category, the percentage is 60%, in the disagree category, the percentage is 4% and finally in the strongly disagree category, the percentage is 0%. The statement stating that teachers become more creative in classroom learning, obtained a percentage of 35% in the strongly agree category. While in the agree category, the percentage was 70%, in the disagree category, the percentage was 0% and in the strongly disagree category, the percentage was 0% as well. The statement that multimedia technology can improve students' skills to be creative, obtained a percentage of 45% in the category of strongly agree.

very agree category. Meanwhile, in the agree category, the percentage is 80%, in the disagree category, the percentage is 0%, as well as the strongly disagree category, the percentage is 0%. Furthermore, the statement that the use of technology is very easy to implement, received a percentage of 30% in the strongly agree category. Whereas in the agree category, it gets a percentage of 60%, in the disagree category it gets a percentage of 0% and in the strongly disagree category it gets a percentage of 0% as well.

The statement stating that digital learning materials are more interesting with the support of diverse content and features, obtained a percentage of 40% in the strongly agree category. While in the agree category, the percentage was 70%, in the disagree category, the percentage was 4% and in the strongly disagree category, the percentage was 0%. This proves that the importance of utilizing multimedia technology in digital learning in the classroom by educators, because many positive impacts will be generated. Furthermore, the statement that learning objectives are achieved well if you can maximize the use of technology.

multimedia, getting a percentage of 50% in the strongly agree category. While in the agree category, the percentage is 45%, in the disagree category, the percentage is 3% and the percentage is 0% in the strongly disagree category. In the statement stating that various competitions will be able to be participated in by students, obtained a percentage of 65% in the strongly agree category. Whereas in the agree category, it obtained a percentage of 45%, in the disagree category, it obtained a percentage of 0%, as well as the strongly disagree category obtained a percentage of 0%.

Furthermore, the statement that makes students creative and innovative in learning, obtained a percentage of 55% in the strongly agree category. While in the agree category, it obtained a percentage of 50%, in the disagree category, it got a percentage of 0%. And in the strongly disagree category obtained a percentage of 0%. The statement stating that convenience will be obtained by maximizing the use of digital content, obtained a percentage of 60% in the strongly agree category. While in the agree category, the percentage is 40%, in the disagree category, the percentage is 0%. agree obtained a percentage of 0%, as well as in the strongly disagree category obtained a percentage of 0% as well. In the statement that increasing school achievement so that it becomes famous and prestigious, obtained a percentage of 70% in the strongly agree category. While in the agree category, it obtained a percentage of 30%, in the

disagree category it obtained a percentage of 0%, as well as in the strongly disagree category obtained a percentage of 0%.

Furthermore, the statement that students are motivated to try new things easily, obtained a percentage of 65% in the strongly agree category. Whereas in the agree category, it obtained a percentage of 60%, in the disagree category obtained a percentage of 0% and in the strongly disagree category obtained a percentage of 0%. Furthermore, the statement stating that digital learning content will certainly develop with the cooperation between several parties, obtained a percentage of 25% in the strongly agree category. While in the agree category, the percentage is 70%, in the disagree category, the percentage is 5% and in the strongly disagree category, the percentage is 0%.

Strongly disagree obtained a percentage of 0%. Finally, the statement stating that there needs to be community support to develop this learning content, obtained a percentage of 25% in the strongly agree category. In the agree category, the percentage is 60%, in the disagree category, the percentage is 0% and in the strongly disagree category, the percentage is 0%.

The characteristics of learning multimedia technology are having more than one convergent media, for example combining audio and visual elements, being interactive in the sense of having the ability to accommodate user responses. Independent in the sense of providing convenience and completeness of content in such a way that users can use it without the guidance of others. The function of multimedia is to be able to strengthen user responses as soon as possible and as often as possible, to be able to provide opportunities for students to control the pace of their own learning and to pay attention that students follow a clear and controlled sequence. Advantages multimedia for this learning is to enlarge objects that are very small and invisible to the eye, such as germs, bacteria, electrons. Shrinking large objects that are

impossible to present at school, such as elephants, houses, buildings, and others.

The result of this research is very beneficial for education if it is able to utilize multimedia technology in the development of digital learning content by presenting interesting features. So that the objectives to be achieved are realized. Students and teachers are also helped in the teaching and learning process in the classroom. The advantage of digital learning content is that through internet connection, it can track learners' responses easily, it can be produced for joint training or self-learning, it can be integrated with facilitation, social interaction and online collaboration activities. It combines learning with different media elements, such as text, graphics, audio and video. Some are mobile responsive, meaning they can also be accessed and displayed properly on mobile devices. There is a need for diverse digital learning content, because students have different learning styles, so it must be considered and accommodated. The method used in this research is quantitative, by distributing questionnaires.

The purpose of this research is to find out the utilization of multimedia technology in developing digital learning content creatively and innovatively to advance education. The use of multimedia technology must be balanced with learning strategies that are suitable for students, so that learning outcomes are maximized and can increase digital content editing skills by students or educators. The types of digital content that can be utilized are simple digital resources. These are materials that are non-interactive in nature. This means that learners can only read or watch the content, but cannot perform other actions. Examples of electronic documents are digital hand-outs, e-books, electronic journals and power point presentations. The second is videos, podcasts, games, quizzes or exams, and so on. All of these contents can be utilized according to teaching needs.

IV. CONCLUSIONS

Based on the discussion of the research above, it can be concluded that the maximum utilization of multimedia technology for creative learning content development will have a positive impact on students. As well as being able to facilitate teachers in delivering material in class, so that learning material can be received easily by students and students become more productive in doing their assignments. They will also not be bored following the learning process, instead they will be interested in learning. Teachers will also find it easy to give the task of making learning contems to students to be creative and innovative in making them. Assessment will also be easy to give with this sophisticated technology. This is of course balanced with the right learning techniques that are also in accordance with the needs of students. Cooperation between all parties involved to advance education is very important to pay attention to and do to realize the learning objectives that have been set. The research method uses a quantitative method by distributing questionnaires about the importance of utilization of multimedia technology for the development of learning content to make it more interesting. The statement is made in a table that states strongly agree, agree, disagree, and strongly disagree. Of course, many agree and support the use of this technology because it has so much influence on students. Changing the perspective that the use of any technology is very important for the advancement of education. They are of the view that the nation's successors must be digitally literate in order to compete and achieve high, so that they can compete internationally. The hope of all parties is of course very helpful in utilizing this technology. Not only into, of course, support and assistance are needed.

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