



## Utilization of Projector Technology in 21st Century Learning: What is the Impact on Student Learning Outcomes?

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**Abstract:** This research examines the impact of the learning process using projector media on student learning outcomes. This research uses a descriptive qualitative approach. The population in this study were students at SD 73/IX Simpang Sungai Duren, totaling 400 students. The sample in the study used a random sampling technique using the Slovin technique with a precision level of 5%, so the number of respondents in this study was 26 people. Data collection techniques in this research used test questions and observation questionnaire sheets. The results of the research show that student activity is 100% or in the very good category, then student focus is 100% in the very good category and also the level of student understanding is Very Good at 73.08%, and the good category at 26.92% which is also in the very good category. This indicates that the projector can contribute to helping the learning process become better.

## INTRODUCTION

The development of technology and information in the 21st century has made the learning process easy. Technological developments provide convenience and are able to help the absolute needs that teachers must fulfill in the learning process (Blau *et al.*, 2020; Divanji *et al.*, 2023). In the learning process, teachers must understand the transfer of knowledge given to students. The knowledge process provided in the learning process is a deliberate and planned effort to provide knowledge to students to become better and more qualified individuals who are able to adapt to changing times in the 21st century era which is full of technology (Defrianti & Iskandar, 2022; Meeuwisse *et al.*, 2023; Sari *et al.*, 2022). The learning process must be able to be measured well, able to provide direction and training to develop the physical and mental potential of students, with the aim that they can reach maturity and carry out life tasks independently in the future. In the modern and contemporary context, the concept of education is always placed within the framework of activities and tasks aimed at the generation or generations that are experiencing a period of growth (Aycock *et al.*, 2002; Ramadhani & Nurita, 2022). Therefore, education focuses more on the formation and maturation of individual personality development, emphasizing dynamic and active aspects, such as the process of continuous development and self-

formation. This makes technology play a major role in facilitating the learning process in the classroom (Ama & Dewa, 2020; Sutaryono & Prasetyaningtyas, 2020).

The large role of technology in the world of education, especially in the learning process, such as the ease of presenting knowledge that is more real in the world, one of which is using projector technology, which is able to simplify and expedite the learning process can be described as the main hope for improving student information in a knowledge, so that information What is obtained will be more real and able to contribute well to improving students' understanding (Fralinger & Owens, 2009; Ozkazanc & Yuksel, 2015; Yuliati, 2001). It is difficult to imagine the existence of human technology in the world of education in the 21st century like now, because the process of providing direction and understanding in dealing with various aspects of life will be difficult to bring closer to a situation that is in line with the existing reality, so that students' enthusiasm will decrease (Gilroy, 2010; Thomas & Akdere, 2013). Utilizing technology in the learning process is able to facilitate students to more easily understand the material being studied and will have an impact on the progress of both student enthusiasm and interest in learning (de Bruin & van Merriënboer, 2017; Fralinger & Owens, 2009; Sulman, 2019). The use of technology in the learning process can be a good supporting tool in influencing student learning outcomes, as well as supporting student activities in the learning process.

The learning process in the 21st century provides opportunities for teachers to always play a role in helping students develop their potential, focus on learning and all activities in the learning process. The teacher will not only be a provider of information or knowledge but also a motivator or stimulus provider to continue learning and knowing more in the broadest sense of information, in other words students will become more independent individuals and have the desire to obtain information other than that acquired in the learning process (Imawan *et al.*, 2023; Sergis *et al.*, 2018). In the world of education, of course, teachers must have confidence in students' potential, so that in the learning process carried out they are able to emphasize the importance of critical awareness in education as a driving force behind the importance of obtaining information or knowledge, which enables individuals to be able to solve problems or problems both in the classroom and in their environment. Teachers must really pay serious attention to students' potential, because if students' potential is not developed then students' abilities may not be utilized to the maximum extent possible, so it will be difficult to produce truly good and qualified students in line with developments in the 21st century (M. Honey *et al.*, 2014; M. A. Honey *et al.*, 2014; Scherer & Siddiq, 2019). In the learning process using a projector it will be able to be a means of increasing students' potential, because the projector is able to provide stimulus, motivation and increase awareness of what is better than the results of the knowledge provided. Technology such as a projector is a tool that researchers believe can be an appropriate means of improving student learning processes and outcomes for the better.

Teachers have an important role in facilitating students during the learning process, one tool that can be used is a projector. Projectors are believed to be able to provide convenience for teachers, among other things, by presenting more contextual learning material, which is able to provide interesting information and at the same time is able to

explore students' abilities and develop their own potential (Maryono *et al.*, 2022). This is because the learning process using a projector makes it easier for teachers to find material and at the same time attracts students' attention in learning. In its implementation, of course teachers must master technological developments, so that they are able to utilize technology to make the learning process easier. Teachers need to continue to improve their ability to facilitate students in understanding the material provided, along with developments over time and learning technology must adapt according to the times and changes in student behavior. . The process of using technology such as a projector can be a suggestion for increasing student activity in achieving better learning outcomes.

The learning process in the 21st century requires teachers to adapt to technology. As time goes by, an effective learning process is created for students by utilizing technology such as projectors in the learning process. In the learning process, the teacher has actually implemented several learning media in delivering the material so that it is easy for students to understand and arouses the ability and desire and interest in learning as well as increasing students' self-motivation to be better able to master the material provided (Divanji *et al.*, 2023; Grace *et al.*, 2014). Choosing the right learning media will help the learning process be good and of good quality. It can be said that learning media is also a very important factor, because the teaching orientation stage greatly influences the effectiveness of the learning process carried out and the delivery of lesson material at that time is a step in increasing student understanding. In the learning process, students must be truly moved and motivated in gaining knowledge (Atkinson *et al.*, 2000; Torres, 2011; Wei *et al.*, 2021). The result of the learning process is to develop students' abilities. Apart from teaching students, teachers must also have a role in supervising and evaluating, developing and assisting students in exploring their potential. However, in the current situation, many teachers are not able to carry out their duties optimally. This is caused by several inhibiting factors, such as the ability of teaching staff who are not yet able to adapt to current developments, limited facilities used in the teaching process, and teachers' lack of understanding about educational transformation (Eagles & Demare, 1999; Friesem, 2016; Grace *et al.*, 2014; Lewis *et al.*, 2010; Meriani & Sari, 2022; Schroeder, 2018; Squire, 2012; Sukiyasa & Sukoco, 2013; Thomas & Akdere, 2013). The ability of teaching staff has a big influence on the effectiveness of the learning process. This is related to how teachers use and master the application of technology in implementing a more effective and quality learning process.

Understanding the above, both theory and facts that researchers have discovered and expressed, then from the problems above it can be said that the importance of technology in the learning process, one of which is the projector. In the learning process, teachers must have an understanding and at the same time teacher sensitivity to the sophistication of technology in the current era regarding the use of learning media, which in this case is the use and importance of projectors (Grace *et al.*, 2014; Maryono *et al.*, 2022). Considering its position as a tool in the learning context, projector media plays a very important role and this component needs to get the attention of teachers and schools when procuring this projector. The implementation of the learning process in schools by implementing integrated media with projector-assisted technology is expected to be able to provide

learning to students with the aim of getting good and effective learning outcomes (Friesem, 2016; Lewis *et al.*, 2010; Schroeder, 2018; Squire, 2012; Sukiyasa & Sukoco, 2013; Thomas & Akdere, 2013). Therefore, the projector becomes a media tool that is the choice for a truly effective and efficient learning process and so that the desired learning objectives can easily be achieved well. Based on this, the researcher becomes a reference that research on projectors influencing learning outcomes must be seen more comprehensively. The researcher wants to explain in more detail and depth the benefits of projectors in terms of increasing understanding and knowledge, especially for teachers or schools, about how projector media in learning can be an appropriate learning tool and can be a means of solving problems that occur in the teaching and learning process with students. It can be said that it is important for teachers to understand and be sensitive to the sophistication of technology in the current era regarding the use of learning media (Friesem, 2016; Sukiyasa & Sukoco, 2013; Thomas & Akdere, 2013). Considering its position in the learning context, media plays a very important role and this component needs to receive teacher attention. namely when you want to apply learning media to students with the aim of getting good learning outcomes. Therefore, it is very necessary to choose media that is truly effective and efficient and so that the desired learning objectives are easily achieved and the information provided is in accordance with current developments.

## **METHOD**

In the research process that was carried out, the researcher used a qualitative approach with a type of field research (filled study) because the data collected was obtained from tests and field observations of the objects studied (Moleong, 2009; Sugiyono, 2012). The population in this study was SD 73/IX Simpang Sungai Duren, totaling 400 students. The sample in this study consisted of 26 students whose sampling was carried out using the probability sampling method, where the method used in sampling was taken randomly. The sample size was determined by applying the Slovin technique with an accuracy level of 5%, so that the number of respondents involved in this research was 26 people. The data collection techniques in this research are test questions and also questionnaires to see directly the consequences of the learning process carried out using a projector. Data was analyzed in two ways, namely providing students' understanding by analyzing students' answers to the test questions, while questionnaires were given during the learning process and the results were used to measure students' focus and learning activities. Both test questions and questionnaires were analyzed using classical statistics without using the SPSS application.

## **RESULT AND DISCUSSION**

The research process provides several insights and facts that show the role of projector media in the learning process in elementary schools is able to influence student learning outcomes both in terms of knowledge and in the form of students' level of understanding of their learning outcomes, and also influences the learning process. In this research, the researcher also looked at the results of activities, both focus and learning

process, experienced by students during the learning process as a result of the influence of the learning media provided, namely the media projector. The learning process with tools, namely using a projector, has a positive impact on both learning outcomes and student learning activities. In this research, data was obtained using questionnaires and tests. In carrying out students' understanding tests, it is carried out at the end of the lesson and first the researcher carries out a projector-assisted learning process to share information and knowledge. The learning process in this research is Pancasila learning with the topic or material taught being rights and obligations. After the learning process was carried out, the researcher gave the students a final test. As for value. The average student learning outcomes based on the test can be seen in table 1.

**Table 1.** Data on the learning process of student learning outcomes assisted by a projector

No	The number of students	Test Result	category of student understanding	Percenteg
1	18	100	Very Good	73,08%
2	1	90		
3	1	85	Good	26,92%
4	6	80		

Based on table 1, it is clear what the student learning outcomes are after using Infocus learning media on learning material, where from the results of the tests carried out the data shows that 73.08% of students or as many as 19 students are in the very good category, while for the category 7 students have grades with a good category, namely when viewed in percentage form, it is 26.92%. Furthermore, the researchers also carried out an interview process to detect whether the projector media used was truly able to make them more happy in the learning process or was in line with the results of the learning values they had prepared. The results of the interviews conducted can be seen in table 2.

**Table 2.** Results of in-depth student interviews regarding the learning process using a projector

No	Question	Total Number of Students	Yes	No	Present
1.	Is learning in class using Projector fun?	26	24	-	90%
2.	Is the media displayed interesting?	26	25	-	95%
3.	Are you more active in learning when using infocus media and images?	26	26	-	100%
4.	Does your teacher also use Infocus media when teaching?	26	-	26	100%
5.	And does your teacher use image media when teaching?	26	26	-	100%
6.	In your opinion, is the material subject difficult?	26	-	26	100%
7.	Does the teacher always invite you to be active in learning in class?	26	26	-	100%

Based on Table 2, it can be understood that students are actually very interested in the learning process using projector media, because projector media is able to help students make very good contributions. Where almost 100% of students stated that learning assisted with a projector was very happy and agreed. However, this data also provides an indication that students have never used a projector in the learning process. This is certainly a bit unfortunate because students' enthusiasm for learning is very high when learning using a projector. This clearly must be maintained by teachers so that learning can run better. If the learning process proceeds better, all student activities that can improve learning outcomes will be good. The percentage of student learning activities in elementary school learning can be seen in Table 3.

**Table 3.** Percentage of student learning activities during the learning process.

No	Aspect Name	Percentage Value (%) Using Media	Percentage Value (%) Not Using Media
1.	Student activity	100%	80%
2.	Student focus	100%	80%

The research data presented in table 3 clearly illustrates that in the learning process student interest and student focus in learning are in the very good category. This clearly indicates that the learning process carried out is able to encourage students to become better, more focused on the material being taught. Almost 100% of all students carry out the learning process with high enthusiasm. This clearly indicates that the learning process can run better and optimally.

#### *Analysis of student learning outcomes with projector-assisted learning*

Learning with the help of a projector can provide a new learning atmosphere for students. Teachers can make the learning process run more systematically or sequentially according to the learning carried out. This can provide a more complete and better picture. A focused learning system will indicate that learning is progressing according to the understanding provided. Forming students' mastery of concepts to understand learning cannot only rely on how a teacher masters the material in carrying out the learning process, but must prioritize the teacher's skills in providing and transforming the knowledge they have for students to understand so that learning can be better and of better quality (Firman & Efendi, 2023; Li et al., 2004). Students' understanding will increase according to the concepts they receive, whether the concepts are received piece by piece or as a whole. If the concept is only partially accepted then it can be predicted that students' learning outcomes will not be optimal.

From the results of the data that has been provided, it is clear that student learning outcomes are in the very good and good categories, of course this indicates that the role of the projector is being able to act as a companion or as an aid to a teacher in carrying out the maximum learning process so that the learning system implemented can run better (Keshavarz, 2012; Kuzmickaja et al., 2015). The learning outcomes of students in the category are very good with a percentage of around 73.08%, which is an indication that

the projector can be a tool that can encourage better student learning outcomes. Increasing student learning outcomes is an illustration that if learning is carried out by utilizing technology, learning will be of higher quality. This is an input for all teachers to be able to improve their skills, especially in the field of education, especially in the 21st century. In line with that, the results of interviews that have been conducted also show similar data or information, where almost 100% of students enjoy learning using projector media. The high level of enthusiasm of students in learning and also the focus of students in learning is a clear indication of how important the role of media is in improving student learning outcomes. Understanding the material is an obligation in the most important analysis in determining success in the learning process. This research clearly shows that the projector is able to provide encouragement and better understanding of students' ability to improve their learning outcomes.

Students' understanding cannot be considered independent of individuals or students themselves. Of course there is knowledge and ways of conveying appropriate knowledge that can encourage students to better understand the content and interpret the material conveyed by the teacher. Understanding the material is the main benchmark for a teacher in determining whether the process carried out or in this case the learning carried out is successful or not. The success of learning can be determined by how much knowledge or how many students can answer questions given by the teacher correctly and accurately (Gazali, 2014; Guo et al., 2020). The accuracy of students answering questions given by the teacher is of course impossible regardless of the students' actual ability to understand the material presented and this understanding can only be achieved if the teacher carries out an effective and good learning process.

#### *Analysis of student activities during the learning process using a projector*

The research process that has been analyzed and is in accordance with the data in Table 3, clearly indicates that in the learning process the right tools are able to provide a good and maximum learning process. The ability of an instrument as a tool, able to encourage students to be more disciplined and focused in understanding learning, in this case is the material provided by the teacher. The level of understanding provided by the teacher can be actively accepted by students, because students think that learning is very interesting to understand and a further study process is also carried out. It cannot be denied that the interest in learning that arises from encouragement within the students themselves is capable of making students' learning activities better, more effective and of better quality (Ouyang & Jiao, 2021; Sukiyasa & Sukoco, 2013).

Learning activities are a condition of students carrying out the learning process, where there is a transfer of knowledge from the teacher in the form of subject matter or additional information that students can use to influence maximum learning outcomes. Of course, learning outcomes are always accompanied by students' activities and enthusiasm in carrying out the learning process (Meriani & Sari, 2022; Rahim et al., 2019). Every student must have the desire to explore knowledge to become better. The process of learning activities must go hand in hand with how the learning is carried out, so in this case the teacher must be able to provide or facilitate students in the learning process so that they

are able to attract students' attention in studying and analyzing knowledge whose ultimate goal is to create learning that is fun and interesting. students' attention.

From the findings that the researcher has expressed in the data above, it is clear that student enthusiasm and also student focus in learning after the teacher explains the learning using focus media has a very good impact. The ability of the projector to provide learning material with a better display, results in students becoming more serious in understanding the material provided, students as a whole become enthusiastic in studying and listening to the understanding provided by the teacher in the learning process carried out (Islamiah et al., 2023; Tan et al., 2014). Students' enthusiasm and focus in learning can indirectly encourage students to have greater curiosity about the material presented. In a learning process, students' curiosity in learning provides a deeper impetus for understanding learning material better.

Students' encouragement and enthusiasm in the learning process can be the initial trigger for students to understand the material better. In the learning process, creating a good and ideal environment is a necessity in order to create a quality and effective learning process (Carte et al., 2011; Lavasani et al., 2011; Mansyur, 2013). The quality of learning cannot be achieved if the process taught is not able to encourage and embrace students to become more active and focused on the material presented by the teacher. However, based on the research results that the researchers found, the researchers can state that the projector is one of the tools that can be used by teachers to create an ideal and effective learning environment. The researchers' findings regarding the influence of this projector are initial information that can be used as input for the learning process in the future. In the learning process, of course, it has been proven that technology, if used in the right way and in the right place, will produce good and quality learning.

## **CONCLUSION**

The process of using technology in the 21st century, especially in the world of education and teaching, has become an obligation. The importance of students' understanding and knowledge with technological developments is able to provide additional information, in this case knowledge that can encourage individuals to become better. In the research that researchers have conducted, it can be concluded that projector media is one of the most appropriate suggestions that schools must have, and can be used by teachers to improve learning outcomes and activities as well as student focus in the learning process. This is proven by the results of research that researchers have conducted showing that all students carry out learning activities, namely 100% or in the very good category, then all students focus on carrying out the learning process, namely with a percentage of 100% and can be declared in the very good category and also the level of student understanding. Very Good at 73.08%, and the good category at 26.92% which is also in the good category. This indicates that the projector is able to contribute to helping the learning process become better. The researcher advises future researchers to further explore the findings that have been obtained, and also provide instruments that are of a higher standard, and pay attention to measuring instruments that are appropriate to the

circumstances and conditions of the researcher's location, so that research can be carried out better.

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