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Research Article

Perspective of high school students in intergrated mathematics with technology post pandemic covid-19

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ABSTRACT

The COVID-19 pandemic has changed the landscape of education around the world, including learning mathematics at the high school level. In response to the pandemic, many schools have adopted distance learning and integrated technology into the learning process. This study aims to analyze the perspectives of high school students in learning mathematics that is integrated with technology after the COVID-19 pandemic. In this context, we will explore students' understanding of the use of technology in learning mathematics, their attitudes towards the use of technology, and their views on the effectiveness of learning mathematics integrated with technology. The research method used in this study is a quantitative research method with the type of research used in this study is correlational. The results of this study are in line with the research objectives, namely to see whether there is an influence of students' perspectives on mathematics learning integrated with technology. The data shows that there is an influence between students' perspectives on learning mathematics that is integrated with technology.

Keywords: High School Students; Mathematics learning; Technology; COVID-19 Pandemic; Distance learning

1. INTRODUCTION

The COVID-19 pandemic has had a significant impact on various sectors of life, including education. Under these conditions, education in Indonesia was forced to undergo drastic changes in teaching and learning methods, namely learning from face-to-face at schools now changing to distance learning or online (Kurniasih, Hidayani, & Muchlis, 2021). Social restrictions and physical school closures have forced students to study from home. To overcome this challenge, technology-based education is one of the most relevant solutions. In the context of learning mathematics at the high school level, technology has played an important role in integrating teaching and learning effectively. Through the integration of technology, students can develop their understanding and skills of mathematics through a more interactive and relevant experience. The world has now entered the era of the industrial revolution 4.0 (Anwar, Saregar, Hasanah, & Widayanti, 2018). The industrial revolution 4.0 is a step from the rapid development of technology which also has an impact on the education sector. This causes many technologies to be applied to learning (Purbawati, Rahmawati, Hidayah, & Wardani, 2020).

The integration of technology in learning mathematics which is a barrier has been widely studied by researchers (Lowther, Lowther, Inan, Strahl, & Ross, 2008). With the rapid flow of technology, ideas and perspectives on technology and technology integration have changed. New technology integration paths are continuously being explored for the development and advancement of education. The use and integration of technology is one of the main challenges of the 21st century (Scherer & Siddique, 2015), including active learning outcomes, and technology, (Cheok dkk., 2016) besides that technology can support independence, participation, communication and collaboration, as well as build active and meaningful learning efficiency (Mioduser, Nachmias, & Forkosh-Baruch, 2008). There are several reasons why the use of technology in learning is very important, namely: 1) closing the gap in the availability of educational materials for all school levels; 2) increase student motivation; 3) able to compete effectively globally; and 4) resource updates (Akbar Iskandar, 2020). The use of technology in learning provides new and meaningful experiences for students. Besides that, it can also improve the teacher's ability in learning creativity (Ramadhani, 2020). And the use of this technology is considered very helpful for learning (Sigid & Purwanto, 2021).

Several relevant studies have been carried out previously, for example research that examines the Exploration of Integrated Research Results by Information Technology and Computers (ICT) in Mathematics Learning (Putri & Suripah, 2021). The results of this study prove that, in general, the results of student research during the 2016-2020 period have not integrated ICT. Integration of Problem Based Mathematics Learning with Information and Communication Technology (Qurohman & Sungkar, 2018). The results of problem-based learning in integrated ICT programs used in mathematics in two courses are (1) the results of student questions spread throughout ICT, including PBL courses, which increased by 89.00% after the previous student score was calculated at a percentage of 22 .87%. (2) In relation to the increase in the provision of programs for students, it was found that the ratio of first class programs to those programs was 64%. Observational data was defined as energetic, and use of II was reflected in increased student interest in work, (3) achievement, activity, and learning, and the average gain of 66.88 students with undergraduate credits and a 56% tuition rate . The average number of students II is 78.27 and the percentage of graduates is 100%. However, none of these studies have discussed in detail or specifically about Perspective Of High School Students In Learning Mathematics Integrated With Technology Post Pandemi Covid-19. The reported research refers more to learning models that are integrated with technology. The exploration of mathematics learning that is integrated with technology is one of the most important studies because technology and communication have a very influential position in achieving educational goals (Aminah, Waluya, & Rochmad, 2020).

This research will involve high school students as research subjects. Data will be collected through class observation and surveys. Various aspects will be explored, including students' perceptions of the effectiveness of using technology in learning mathematics. Also in this research, we aim to explore the perspectives of high school students regarding learning mathematics that is integrated with technology after the COVID-19 pandemic. We will analyze students' experiences of using technology during remote mathematics learning, as well as their perceptions of the effectiveness and usefulness of technology in understanding mathematical concepts.

2. RESEARCH METHOD

The research method used in this study is a quantitative research method with the type of research used in this research is correlational, correlational research is research that is intended to determine the existence of a relationship between two or several variables (Arikunto, 2006). This study aims to analyze the perspectives of high school students in learning mathematics that is integrated with technology after the COVID-19 pandemic. In this context, we will explore students' understanding of the use of technology in learning mathematics, their attitudes towards the use of technology, and their views on the effectiveness of learning mathematics integrated with technology. The population in this study were 125 high school students. Then the sample used was 95 students with the sampling technique used in this study using a non-probability sampling technique, purposive sampling. Namely by selecting a sample from the population (Jonathan Sarwono, 2006). The data based on the gender of students:

Table 1. Research subject demographics

Gender	Amount	%
Man	59	47.2%
Woman	66	52.8%

Based on the **Table 1**, the number of students who became respondents was 125 people, with male sex totaling 59 people (47.2%) and female sex totaling 66 people (52.8%). This study used instruments in the form of questionnaires and documentation. Then the data collected was tested for the validity and reliability of the items. From the results of the validity and reliability trials on the X variable, 18 valid and reliable questionnaire items were obtained, while 19 questionnaire items were obtained on the valid and reliable Y variable. Furthermore, research data collection was carried out by giving a questionnaire with a total of 37 statements to students.

3. RESULTS AND DISCUSSION

In understanding how students form their perspective on learning mathematics that is integrated with technology. So the researchers conducted prerequisite tests including descriptive analysis and inferential analysis on the questionnaire data that had been given. Descriptive data analysis aims to display the conditions or characteristics of the sample data for each

research variable. The data that has been obtained is then processed using Microsoft Excel. Here is the output of the frequency distribution.

Table 2. Descriptive Analysis

X		Y	
Means	69.42105	Means	75.96842
Standard Error	1.146256	Standard Error	1.122752
Median	72	Median	76
Mode	72	Mode	76
Standard Deviations	11.17232	Standard Deviations	10.94323
Sample Variances	124.8208	Sample Variance	119.7543
Kurtosis	4.832945	Kurtosis	8.038147
Skewness	-1.41027	Skewness	-1.86591
Range	72	Range	76
Minimum	18	Minimum	19
Maximum	90	Maximum	95
Sum	6595	Sum	7217
Count	95	Count	95

To find out whether the data used is normally distributed or not, a normality test is performed. The normality test is used when the number of sample data or observations is less than 30. The normality test is used to see whether the error terms are close to a normal distribution. If the number of sample data or observations exceeds 30, then a normality test is not needed because the distribution of the sampling error terms is close to normal (Rohmatul Ajija Shochrul, 2011). In this study, the normality test was carried out using the Kolmogorov Smirnov test. The basis for decision making in the Kolmogorov Smirnov test is if the significance value is > 0.05, then the data is said to be normal. And the data is said to be abnormal if the significance value is < 0.05. In this study, the normality test was carried out using the help of the IBM SPSS Statistics 25 application. The following are the results of the normality test.

Table 3. Normality test (One-Sample Kolmogorov-Smirnov Test)

Ustandardidized Residual ed		
N		95
Normal Parameters	Means	.0000000
	std. Deviation	7.50073415
Most Extreme Differences	absolute	089
	Positive	076
	Negative	-.089
Test Statistics		089
asymp. Sig. (2-tailed)		.061º

Based on the **Table 3**, it can be seen that the significance value is 0.061. So, it can be concluded that the data obtained above is normally distributed. Because of its significance value (0.061 > 0.05) (Motulsky, 2018). To test linearity in this study, the authors used help from the IBM SPSS Statistics 25 application. The following are the results of the linearity test. Based on the results of the **Table 4**, it can be seen that the significance value of the Deviation from Linearity is 0.120. In making decisions on the linearity test, the data is said to be linear if the significance value is > 0.05. And the data is said to be non-linear if the significance value is < 0.05. In this way, it can be concluded that there is a linear relationship between the student perspective variable (X) and the mathematics learning variable integrated in technology (Y).

Next, a hypothesis test was carried out, namely a simple linear regression analysis. Simple linear regression analysis is used to determine whether there is an influence between the independent variables and the dependent variable. The following are the results of a simple linear regression analysis using the help of the IBM SPSS Statistics 25 application. Based the results of the **Table 5**, it can be seen that the calculated F value = 104.955 with a significance level of 0.000 < 0.005, so the regression model can be used to predict the student's perspective variable on mathematics learning or in other words there is an influence on the student's perspective variable on mathematics learning (X) on the variable mathematics learning that is integrated with technology.

Then the researcher conducted a T test. This test was conducted to see the effect of the independent variable on the dependent variable by comparing the t_{table} value with t_{count}. Tcount can be seen in **Table 6.**

Table 4. Linearity Test (ANOVA Table)

			Sum of Squares	df	Mean Square	F	Sig
Mathematics learning that is integrated with technology * Students' perspectives on learning mathematics	Between Groups	(Combined)	8284718	34	243,668	4,919	.000
		Linearity	5968370	1	5968370	120,484	.000
		Deviation From Linearity	2316.348	33	70,192	1,417	.120
	Within Groups		2972,188	60	49,536		
	Total		11256.905	94			

Table 5. Simple Linear Regression Analysis Test (ANOVA [a])

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	5968370	1	5958,370	104,955	.000[b]
residual	5288535	93	56,866		
Total	11256.905	94			

Table 6. Test T (Coefficients [a])

Model	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval For B	
						Lower Bound	Upper bound
(Constant)	26,456	4,894		5,405	.000	16,737	36,176
Student perspectives on learning mathematics	.713	.070	.728	10.245	.000	.575	.851

Based on the **Table 7**, it can be seen that the independent variable (students' perspective on learning mathematics) has a t_{count} of 10.245. Next is to calculate t_{table} using the formula a/2 = 0.05/0.025, degrees of freedom (df) n-2 = 95-2 = 93. Then looking at the t distribution table, we get a t_{table} of 1.986. Because $t_{count} > t_{table}$, then H_0 is rejected and H1 is accepted. It can be concluded that there is an influence between students' perspectives on learning mathematics that is integrated with technology. The coefficient of determination aims to see what the percentage level of influence of the independent variable is on the dependent variable. The following is the output of the coefficient of determination **Table 7**.

Table 7. Coefficient of determination (Model Summary)

Model	R	R Square	Adjusted R Square	std. Error of yhe Estimate
1	.728 a	.530	.525	7,541

It can also be seen from the Model Summary table above that the value of the correlation/relationship (R) is 0.728. From the output, it is obtained that the coefficient of determination (R Square) is 0.525, which implies that the influence of the independent variable (student perspective on learning mathematics) on the dependent variable (Mathematics learning integrated with technology) is 52.5%. Based on the t test table, it can be seen that the significance value is 0.00 < 0.05. So, it can be concluded that H0 is rejected and H1 is accepted. So that there is an influence between students' perspectives on mathematics learning that is integrated with technology.

4. CONCLUSION

The results of this study are in line with the research objective, which is to see whether there is an influence on students' perspectives on learning mathematics that is integrated with technology. The data shows that there is an influence between students' perspectives on learning mathematics that is integrated with technology. The results of distributing questionnaires or questionnaires on variable X, namely the student perspective, it is known that the highest value is 90 and the lowest value is 18. Furthermore, the results of distributing questionnaires or questionnaires on variable Y, namely learning mathematics integrated with technology, are known to have the highest value of 95 and the highest value the lowest is 19. Furthermore, the results of normality trials on both variables, namely mathematics learning integrated with technology and student perspectives using IBM SPSS Statistics 25, conclude that the data is normal with Asymp numbers. Sig (2-Tailed) 0.061 > from the significance level of 0.05. Furthermore, the linearity test which can be seen by its

significance value on Deviation from Linearity is 0.120. So, it can be stated that there is an influence between students' perspectives on learning mathematics that is integrated with technology. Then a simple linear regression test was carried out to obtain a calculated F value = 104.955 with a significance level of 0.000 < 0.005, so in other words there is an influence of the student perspective variable (X) on the mathematics learning variable integrated with technology (Y). Then a t test was carried out and a t_{count} of 10.245 was obtained and a t_{table} with 93 degrees of freedom was also obtained, namely 1.986. Because $t_{count} > t_{table}$, then H0 is rejected and H1 is accepted. It can be concluded that there is an influence between students' perspectives on learning mathematics that is integrated with technology. Then do the analysis of the coefficient of determination and the R Square value is 0.525 which can be concluded that the effect of the independent variable (student perspective on learning mathematics) on the dependent variable (Mathematics learning integrated with technology) is 52.5%. Furthermore, hypothesis testing is carried out to see whether there is an influence between variable X on variable Y by comparing the sig value and the level of 0.05. Based on calculations with the IBM SPSS Statistics 25 application, a significance value of 0.00 < 0.05 is obtained. It can be concluded that H0 is rejected and H1 is accepted. Where is the influence of students' perspectives on mathematics learning that is integrated with technology. As for some suggestions that can be given based on research results, namely: first, so that further research can develop research with other types so that it is more varied; second, so that further research does not discuss from the student's perspective only but from the teacher's point of view/perspective as well; third, in order to develop ICT media in learning mathematics, namely by using mathematical applications or software.

CONFLICT OF INTEREST

There are no conflicts of interest declared by the authors.

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