The Effect of Access to Technology on 4C Skills

(Study on Students of the Faculty of Economics and Business, Wahid Hasyim University Class of 2021)

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***ABSTRACT**: Currently in the digital era, access to technology is a crucial element in various aspects of life, including in the field of education. Colleges play an important role in preparing competitive graduates in the 21st century with the 4Cs skills: critical thinking, the ability to communicate, effective collaboration, and the development of Creativity. This study aims to analyze the effect of easy access to technology on the development of 4C competencies (Critical Thinking, Creativity, Communication, and Collaboration) in students of the Faculty of Economics and Business class of 2021 at Wahid Hashim University. The data analysis method was carried out by selecting samples from the population being studied, then continued to fill out a questionnaire by students of the Faculty of Economics and Business class of 2021 at Wahid Hasyim University. The population that is the focus of this study includes all students of the 2021 class of the Faculty of Economics and Business at Wahid Hashim University, using a sample of 68 respondents. The findings from the study reveal that access to technology has a positive and significant impact on the development of 4C skills.*

***Keywords**: technology access, 4C skills*

***ABSTRACT**: In the current digital age, access to technology is a critical element across various life aspects, particularly in education. Higher education institutions play a vital role in equipping graduates with competitive skills necessary for the 21st century, which include the 4C competencies: Critical Thinking, Communication, Collaboration, and Creativity. This research aims to examine the impact of easy access to technology on the development of 4C competencies among students from the Faculty of Economics and Business, class of 2021, at Universitas Wahid Hasyim. The data analysis method involves sampling from the research population, followed by administering questionnaires to the students of the Faculty of Economics and Business, class of 2021, at Universitas Wahid Hasyim. The study focuses on the entire population of students from the 2021 cohort at the Faculty Economic and Business, with a sample size of 68 respondents. The findings indicate that access to technology positively and significantly influences the enhancement of 4C skills.*

***Keywords**: access to technology, 4C skills*

1. INTRODUCTION

In today's digital era, access to technology has become a very crucial element in various sectors of life, especially the education sector. Colleges have a great responsibility in producing superior graduates by equipping them with skills that are appropriate to the guidance of the 21st century, such as learning and innovating skills, in addition to mastery of knowledge and technology relevant to their respective fields

(Zubaidah, 2018a). One of the significant effects of ease of access to technology is the improvement of 21st century competencies known as the 4Cs skills including critical thinking, the ability to communicate, effective collaboration, and the development of Creativity. These skills are considered essential in preparing individuals to face the complex challenges in today's work environment and modern society. With a focus on human resource management (HR), emphasizing the importance of developing these skills because they are closely related to work effectiveness and future leadership. The increasingly advanced world of information technology requires students and educators to understand information technology, utilize it in teaching and learning activities, and improve skills and competitiveness.

Previous research indicates that digital technology has significant potential to improve 4C competencies. The use of ICT in education has been proven to encourage students to think more critically, collaborate more effectively, communicate better, and develop creativity (Nurlaela et al., 2023). However, the application of technology in learning still faces various obstacles, such as low technological literacy and lack of readiness from lecturers and students. This shows that while technology has great potential, other factors such as access gaps and technological literacy also play an important role in determining the success of the 4Cs skill development.

This study aims to examine the impact of technology access on the development of 4C skills among students of the Faculty of Economics and Business at Wahid Hashim University, especially for the class of 2021. The main focus includes the extent to which technology supports data-driven decision-making capabilities, improved public speaking skills, and the effectiveness of student teamwork and collaboration. This study also assesses the role of technology in encouraging student creativity and innovation, as well as identifying challenges and opportunities in the use of technology to develop 4C skills. Students must have digital skills to select and filter the information they receive and bridge the digital gap for students, such as closing the access gap to digital technology. Students who live in remote areas or come from underprivileged families may not have equal access to digital technology. Therefore, they need to be taught to use technology in a wise and responsible way. The success of education in the digital era certainly requires support from educators, such as lecturers, teachers, and teaching staff who have the ability to utilize technology with optimal methods and allow to provide student assistance in mastering learning materials better. Lecturers must also be flexible in managing students and easily adapt to any changes (Andi Sadriani et al., 2023). It is hoped that the results of this research can offer practical solutions and recommendations to improve the quality of the learning process in the digital era.

Based on the background explanation that has been submitted, this study proposes a hypothesis that optimal access to technology can make a significant contribution to the development of 4C skills among students. The integration of digital literacy and the readiness of teachers to utilize technology is considered a key factor to improve critical thinking, communication, cooperation, and innovation skills. In accordance with previous findings, the application of technology in the learning process has proven to be effective in developing these skills (Nurlaela et al., 2023). This article aims to analyze the role of technology access, digital literacy, and the readiness of lecturers and students in using technology to improve 4C skills, which is ultimately expected to prepare graduates to face challenges in today's world of work.

2. METHOD

2.1 Research Location

The place of this research focuses on the Faculty of Economics and Business at Wahid Hashim University, with the main target of students of the class of 2021 who can provide information related to the problem being researched.

2.2 Type of Research

This study applies a quantitative approach with the aim of analyzing the influence of technology access on the development of 4C skills among students of the Faculty of Economics and Business class of 2021, Wahid Hashim University. The quantitative research approach is based on the philosophy of positivism applied to conduct research on a certain population group or sample using the sampling method, usually carried out by random method. Data was collected using research tools, while quantitative or statistical data analysis aimed to test predetermined hypotheses according to (Sugiyono, 2013) in (Suwarsa, 2021). In this study, data analysis was carried out with the help of SPSS (Statistical Package for the Social Sciences) software version 24.0.

2.3 Data Collection Procedure

This study applies the method of obtaining data through questionnaires or questionnaires, which is a way to collect data that involves collecting a series of questions and written statements that must be answered by respondents.

2.4 Population and Sample

Population

According to Sugiyono (2014:115) in (Suwarsa, 2021), population can be defined as a generalization area that includes objects or subjects with certain qualities and characteristics determined by the researcher to be analyzed and drawn conclusions. In this study, the population that is the focus is students of the Faculty of Economics and Business, Wahid Hasyim University class of 2021.

Sample

According to Agus Salim Manguluang (2010:94 in (Pratama et al., 2022), the sample is a small fraction of the overall population. In this study, the researcher determined the sample by narrowing the population by taking into account the Slovin formula with a margin of error of 1%. Here is the formula Slovin used:

$$\boldsymbol{n = \frac{N}{1 + Ne^2}}$$

Description:

n = number of samples
N = total population
e = tolerable error limit (10%)

Based on the total student population of the Faculty of Economics and Business, Wahid Hasyim University class of 2021, by setting a tolerance limit of 10%, the number of samples to be studied can be determined as follows:

$$\boldsymbol{n = \frac{N}{1 + Ne^2}}$$

$$\boldsymbol{n = \frac{212}{1+212(0{,}1)^2} = \frac{212}{1+212(0{,}01)^2} = \frac{212}{1+2{,}212} = \frac{212}{3{,}12} = 67{,}948 = 68} \text{ student}$$

Thus, the minimum total sample that can be applied in this study is 67,948 participants. After rounding, the number of respondents was set to 68 people. Based on the results of the calculation obtained by applying the Slovin formula, the number of participants to be used as a sample in this study was determined to be 68 people.

3. RESULT AND DISCUSSION

3.1 Characteristics Responden

Based on the results of a questionnaire submitted to students of the Faculty of Economics and Business, Wahid Hasyim University class of 2021, the author managed to collect data from 68 respondents. The details of respondents by gender are as follows: 15 people (22.1%) respondents are male and 53 people (77.9%) are female. As for age, there were 10 respondents between 17-20 years old and 58 respondents aged 21-24 years.

3.2 Validity Test

The validity test was carried out using SPSS (Statistical Package for the Social Sciences) version 24.0 to test the validity of the instrument, where the questionnaire was tested on 68 respondents. The r-value of the table is determined by the formula df=n-2, where DF is the degree of freedom and n is the number of respondents. With 68 respondents, df=68-2=66 was obtained. From these results, the r table for 66 respondents was 0.244 with a probability value (sig) < 0.05. The instrument is considered valid if the calculated r is equal to or greater than the table r at a significance level of 5%. On the other hand, an instrument is said to be invalid if r calculates less than r table.

Table 1

Results of the Validity Test of Technology Access Variables (X)

Item	r Count	r Table	Sig.	Description
AT1	0,460	0,244	0,000	Valid
AT2	0,664	0,244	0,000	Valid
AT3	0,714	0,244	0,000	Valid
AT4	0,677	0,244	0,000	Valid
AT5	0,607	0,244	0,000	Valid
AT6	0,579	0,244	0,000	Valid
AT7	0,804	0,244	0,000	Valid
AT8	0,728	0,244	0,000	Valid
AT9	0,572	0,244	0,000	Valid
AT10	0,759	0,244	0,000	Valid
AT11	0,790	0,244	0,000	Valid
AT12	0,732	0,244	0,000	Valid
AT13	0,740	0,244	0,000	Valid
AT14	0,729	0,244	0,000	Valid
AT15	0,741	0,244	0,000	Valid

Table 2

Results of the 4C (Y) Skill Variable Validity Test

Item	r Count	r Table	Sig.	Description
K4C1	0,743	0,244	0,000	Valid
K4C2	0,636	0,244	0,000	Valid
K4C3	0,660	0,244	0,000	Valid
K4C4	0,708	0,244	0,000	Valid
K4C5	0,864	0,244	0,000	Valid
K4C6	0,768	0,244	0,000	Valid
K4C7	0,773	0,244	0,000	Valid
K4C8	0,820	0,244	0,000	Valid
K4C9	0,778	0,244	0,000	Valid
K4C10	0,746	0,244	0,000	Valid
K4C11	0,776	0,244	0,000	Valid
K4C12	0,679	0,244	0,000	Valid
K4C13	0,754	0,244	0,000	Valid
K4C14	0,742	0,244	0,000	Valid
K4C15	0,767	0,244	0,000	Valid
K4C16	0,736	0,244	0,000	Valid
K4C17	0,805	0,244	0,000	Valid
K4C18	0,717	0,244	0,000	Valid
K4C19	0,827	0,244	0,000	Valid
K4C20	0,652	0,244	0,000	Valid
K4C21	0,839	0,244	0,000	Valid
K4C22	0,761	0,244	0,000	Valid
K4C23	0,788	0,244	0,000	Valid
K4C24	0,776	0,244	0,000	Valid

Based on tables 1 and 2, the validity test results show that each statement regarding access to technology and 4C skills has a greater r calculation than the r table. Thus, it

can be concluded that the results of the validity test are considered valid and can be applied to the testing of research instruments.

3.3 Reliability Test

The reliability test aims to determine the level of accuracy and consistency of the indicators contained in the questionnaire. This test can be performed in its entirety on all statement items, where the instrument is considered reliable if the r value (Cronbach's alpha) is greater than 0.60.

Reliability Statistics

Cronbach's Alpha	N of Items
.921	15

Picture 1. Results of the Reliability Test of Technology Access Variables (X)

Reliability Statistics

Cronbach's Alpha	N of Items
.967	24

Picture 2. Results of the 4C (Y) Skill Variable Reliability Test

Based on figures 1 and 2, the reliability test results indicate that Cronbach's alpha value in all variables exceeds 0.60. Thus, it can be concluded that the reliability test results for the variables of the research instrument are declared reliable.

3.4 Normality Test

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		68
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	9.11889621
Most Extreme Differences	Absolute	.094
	Positive	.094
	Negative	-.070
Test Statistic		.094
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

Picture 3. Normality Test Results

Based on the normality test that has been presented, the significance value of Kolmogorov-Smirnov was recorded at 0.200 which exceeded 0.05. Thus, it can be concluded that the regression model in this study is normally distributed.

3.5 Multicollinearity Test

Coefficients[a]

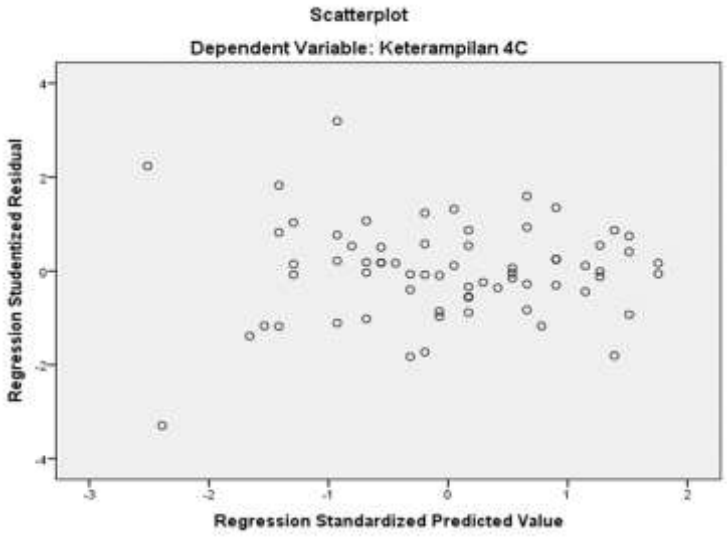
Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	34.317	8.100		4.237	.000		
	Akses Teknologi	1.113	.137	.707	8.129	.000	1.000	1.000

a. Dependent Variable: Keterampilan 4C

Picture 4. Multicollinearity Test Results

Based on the results of the multicollinearity test that has been explained, the VIF (Variance Inflation Factor) value is 1,000, which is less than 10, and the tolerance value is recorded at 1,000, which also exceeds 0.1. Therefore, it can be concluded that there is no multicollinearity.

3.6 Heteroscedasticity Test



Picture 5. Heteroscedasticity Test Results

Referring to the image above, it can be seen that the data points are scattered randomly around the number 0 on the Y axis, without a clear pattern. Therefore, it can be concluded that there is no heteroscedasticity in this regression model, so the model can be used to conduct research.

3.7 Simple Linear Regression

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	34.317	8.100		4.237	.000
	Akses Teknologi	1.113	.137	.707	8.129	.000

a. Dependent Variable: Keterampilan 4C

Picture 6. Simple Linear Regression Test Results

Based on the figure presented, the linear regression equation that shows the relationship between the variables in this study can be explained as follows:

$$\square = 34.317 + 1.113\square$$

From the simple linear regression that has been described, it can be described as follows:

1. The value of the constant a indicates 34.317, that if there is no change in the independent variable (when the value of X is 0), then the value of the dependent variable (Y) will be 34.317.
2. The regression coefficient value for variable X (Technology Access) is 1.113 and is positive. This indicates that if there is an increase of 1 unit in technology access, so that the 4C Skills will increase by 1,113.

3.8 Test T (partial)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	34.317	8.100		4.237	.000
	Akses Teknologi	1.113	.137	.707	8.129	.000

a. Dependent Variable: Keterampilan 4C

Picture 7. T Test Results

Referring to the image of the t-test results above, it indicates that t counts 8,129 > t table 1,997 sig 0.000 < 0.05. This indicates that access to technology has a positive and significant influence on 4C skills.

3.9 Coefficient Test of Determination

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.707[a]	.500	.493	9.18772

a. Predictors: (Constant), Akses Teknologi

Picture 8. Coefficient of Determination Test Results

Based on the image shown, the value of the R Square determination coefficient is 0.500 or 50%. Thus, it can be concluded that the influence of the variable of technology access on 4C skills is 0.500 (50%).($\square^2$)

4. CONCLUSION

Based on the analysis of the results of research and discussion on the influence of technology access on 4C skills in students of the Faculty of Economics and Business, Wahid Hasyim University class of 2021, which includes testing validity, reliability, normality, multicollinearity, heteroscedasticity, simple linear regression, T test, and coefficient of determination, it is stated that:

There is a positive contribution from Technology Access to 4C Skills. This identifies that Access to Technology can be influenced by the 4C Skills in students of the 2021

batch of the Faculty of Economics and Business, Wahid Hashim University. From the findings of data analysis, it was found that increasing access to technology positively affected students' data-driven decision-making skills, public speaking skills, team collaboration, and creativity. This statement is in line with the concept of literature that shows that the use of information technology in the learning process can improve the quality of 21st century skills learning, which is also supported by previous studies.

However, this study also found several weaknesses, such as varying digital literacy and the readiness of lecturers and students in utilizing technology that is not optimal. Although technology has great potential, the access gap and digital literacy are still obstacles in its implementation. This shows that the availability of technology alone is not enough without adequate training and literacy.

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