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THE INFLUENCE OF RESILIENCE AND HABITS OF MIND ON STUDENTS' COMPUTATIONAL THINKING

Siti Nurkomariyah[1], Elsa Komala[2*]
[1]Mathematics Education, Suryakancana University, Cianjur, Indonesia
email: elsakomala@gmail.com

Abstract: Having computational thinking skills is a must for someone living in the 21st century, especially in learning mathematics. Apart from cognitive aspects, resilience and habits of mind are affective aspects which are one of the most important aspects in learning. When working on mathematics questions, students still appear less active when asking questions about material they don't understand, there are still many students who give up easily when given difficult mathematics questions. Because of the habits of thinking, acting and behaving in the context of learning at school and in the surrounding environment. Thus, the aim of this research is to determine the influence of resilience and habits of mind together on students' computational thinking. This study uses a quantitative approach. The population of this study were all class X students at one of the private vocational schools in Cianjur. As for the sample in this research, 1 class of 24 students was selected using purposive sampling technique. To obtain research data, instruments were used in the form of student computational thinking tests, resilience questionnaires and student habits of mind. Data processing uses multiple linear regression analysis. Based on data analysis, the research results show that there is no influence of resilience and habits of mind on students' computational thinking.

Keywords: Habits of Mind, Resilience, Student Computation Thinking.

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INTRODUCTION

The emergence of the term Industrial Revolution 4.0 in the 21st century is marked by massive developments in technology and information. Therefore, this requires the world of education to be able to design curriculum and learning so that students have the skills to be globally competitive (Cahdriyana & Richardo, 2020). One of the skills that supports the development of technology and information is computational thinking (Izzah *et al*., 2023). Based on the opinion of Suparmiyati *et al*., (2023) who state that computational thinking has become a basic ability that everyone must have in the 21st century, just like reading, writing and arithmetic. In line with the National Research Council (NSF) which states that computational thinking is a need for every individual, not just programmers. This causes computational thinking to help individuals manage information effectively and efficiently using technology, especially in today's digital era (Kharisma *et al.*, 2024).

The importance of computational thinking is developed considering the current

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facts in the world of education that cannot be separated from computational thinking in solving problems, therefore, computational thinking needs to be improved considering the low impact computational thinking has on student learning outcomes (Mania, 2021). Regarding computational thinking in solving problems, and can be implemented in various scientific disciplines, mathematics is the right field of science as a means to develop these abilities in students other than computer science (Cahdriyana & Richardo, 2020). When researchers carried out an Introduction to Schooling Fields at one of the vocational schools in Cianjur, there were still students who, when working on mathematics practice questions, were not able to describe the questions and find patterns for solving the practice questions correctly. This identifies that there are indicators in computational thinking, namely decomposition and algorithms. This illustrates that computational thinking students are not yet optimal. According to research from Mufidah (2018) which revealed that in current mathematics learning, students are still less able to solve problems by linking the information obtained and this results in low computational thinking and needs to be improved. Computational ability is the most important thing, but there are still many students with weak computational ability (Rahmadhani & Mariani, 2021).

Apart from the cognitive aspect, the affective aspect is one of the most important aspects in learning (Nabillah & Abadi, 2019). In the world of education, mathematics is the basis for the development of other sciences, because mathematics has the power to be applied to several aspects including technology (Handayani, 2023). Therefore, mathematics plays an important role in the progress of science, technology and communication that we are currently experiencing (Azizah & Abadi, 2022). However, mathematics is not an easy subject to learn, so there are several difficulties and obstacles in the learning process, which can reduce students' enthusiasm for learning (Iman & Firmansyah, 2019). These difficulties are caused because learning mathematics is full of challenges, making students feel anxious and try to avoid mathematics. This can be overcome by a serious, tenacious and confident attitude which is called resilience (Azizah & Abadi, 2022). When researchers carried out an introduction to the field of schooling in 2023 at one of the vocational schools in Cianjur on mathematics learning, they found not only mathematical abilities but also affective aspects, problems were also found, in this case students in doing math exercises, it was still visible from students who were not active. asking teachers or other friends about material they don't understand, as well as students who easily give up when given math questions that are considered difficult. This identifies that students still have problems related to resilience. The importance of mathematical resilience is seen in mathematics education research, because students experience obstacles, difficulties and anxiety in learning mathematics, which leads to students' dislike of mathematics (Fatimah & Purba, 2021). This causes students to try to avoid studying and working on mathematics problems. To face anxiety, fear in facing challenges and difficulties, requires hard work and good language skills, students need to have a persistent and tough attitude which is found in mathematical resilience (Rahmatiya & Miatun, 2020).

Apart from resilience, another affective aspect related to mathematics learning which is related to behavioral tendencies is habits, another habit in this case is thinking habits. Habits of mind according to Ayu & Katmaningsih (2022) are the characteristics of what intelligent people do when they are faced with problems whose solutions cannot

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be easily known. The facts in the field in one of the schools in Cianjur when learning mathematics, found not only in mathematical abilities but also in affective aspects problems were found, in this case the students also still thought that the problem must be difficult, without them first trying to solve the problem. This identifies that students always give up easily when facing mathematical problems that are considered difficult. This is part of habits of mind. In line with Ridlo & Rukmigarsari (2021) that there is an influence of habit of mind and mathematical resilience together on students' mathematical critical thinking abilities in class VIII number pattern material. Based on the problems described previously, this research aims to determine the influence of resilience and habits of mind on students' computational thinking.

METHOD

The method used in this research is a quantitative method with a multiple linear regression analysis model, because the researcher determines the best set of independent variables so that it can provide the most accurate prediction results based on a test measuring tool in the form of a 3-question computational thinking test with computational thinking indicators according to Lee et al. al., (2012), namely (a) problem decomposition, (b) algorithmic thinking, (c) pattern recognition, and (d) abstraction and generalization. The resilience questionnaire measures 10 statements with indicators adapted according to Hendriana et al., (2017), namely: (a) showing an attitude of perseverance, confidence/self-confidence, working hard, and not giving up easily in the face of failure and uncertainty; (b) show a desire to socialize, easily provide help, discuss with peers; (c) generate new ideas/methods by looking for creative solutions to challenges; (d) using failure experiences to build self-motivation; (e) have curiosity, reflect, research, and utilize various sources; and (f) have the ability to control themselves, be aware of their feelings; and Habits of mind questionnaire with 10 statements based on Costa & Kallick (2009) indicators as follows (a) persevere/never give up, (b) regulate your conscience, (c) empathize, (d) think flexibly and reflectively, (e) think metacognitive, (f) trying to work thoroughly and precisely, (g) asking questions and posing problems effectively, (h) utilizing old experiences to form new knowledge, (i) thinking and communicating clearly and precisely, (j) utilizing the senses in gathering and processing data, (k) creating, creating, and innovating, (l) enthusiastic in responding, (m) brave to take responsibility and face risks, (n) humorous, (o) interdependent, (p) continuous learning.

This research was carried out at a vocational school in Cianjur. Of the 10 existing classes, one class was chosen as the research subject, namely students of class In this research, data is generally analyzed using SPSS Statistics 22 software, assumption tests consisting of normality tests, linearity tests, heteroscedasticity tests, multicollinearity tests and continued with multiple linear regression analysis.

RESULT AND DISCUSSION

Result

Resilience and habits of mind were measured using questionnaire instruments. However, computational thinking uses test instruments. Therefore, the test used is a multiple linear regression test. The prerequisite tests that must be carried out in the multiple linear

regression test are the normality test, heteroscedasticity test and multicollinearity test. The normality test uses the One-Sample Kolmogorov-Smirnov Test in table 1. as follows:

Table 1. Normality Assumption Test

Asymp. Sig. (2-tailed)	**.181**[c]

Based on table 1, if the Asymp.Sig (2-tailed) value is >0.05, it can be concluded that the data is normally distributed. The Asymp.Sig (2-tailed) value obtained is 0.181 > 0.05, so the data is normally distributed. Then the next assumption test is the heteroscedasticity test in table 2. The heteroscedasticity test uses the following

Table 2. Heteroscedasticity Assumption Test

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.671	6.222		.269	.791
	Resilience	.249	.207	.256	1.207	.241
	Hom	-.183	.166	-.234	-1.101	.284

Based on table 2, if the significance value is > 0.05, it can be concluded that there are no symptoms of heteroscedasticity in the data. The significance value obtained for resilience was 0.241 > 0.05 and for habits of mind the value was 0.284 > 0.05 because both data met heteroscedasticity, so it was concluded that there were no symptoms of heteroscedasticity. Followed by the multicollinearity assumption test in table 3. as follows:

Table 3. Multicollinearity Assumption Test

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	24.450	12.742		1.919	.069		
	resilience	-.893	.423	-.383	-2.111	.047	.956	1.046
	hom	.988	.341	.526	2.900	.009	.956	1.046

Based on table 3, if the tolerance value is > 0.100 and VIF < 10.00, it can be concluded that there are no symptoms of muticolinearity. For the resilience and habits of mind variables, the tolerance value is 0.956 > 0.100 and VIF 1.046 < 10.00, so it can be concluded that the multicollinearity assumption has been met.

Based on table 2. Obtained multiple linear regression equation Y' = 1.671 + 0.249 X1 - 0.183 X2

a. The constant value obtained is 1.671 which means that if resilience and habits of mind are assumed to be 0 then the computational thinking value is 1.671.
b. The regression coefficient value of the resilience variable is positive at 0.249, which means that if there is a 1% increase in the resilience variable, it will have an effect on

computational thinking of 0.249.

c. The regression coefficient value for the habit of mind variable is positive at - 0.183, which means that if there is a 1% increase in the habit of mind variable it will have an effect on computational thinking of - 0.183.

The following are the results of the multiple linear regression test between resilience and habits of mind on computational thinking with statistical tests shown in table 4. as follows:

Table 4. F Test Results of the Effect of Resilience and Habits of Mind on Students' Computational Thinking

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.864	2	4.932	1.103	.350[b]
	Residual	93.889	21	4.471		
	Total	103.753	23			

Based on table 4, if the sig value is <0.05, it can be concluded that resilience and habits of mind have a significant effect simultaneously (together) on computational thinking. The significance value obtained is 0.350 > 0.05, so it can be concluded that resilience and habits of mind do not simultaneously (together) influence computational thinking.

Discussion

The results of this study found that there was no influence between resilience and habits of mind on students' Computational thinking abilities, based on the results of the questionnaire, students' resilience was still lacking, especially in the indicator "persistent and never giving up". This is in contrast to the results of previous research (Ahmad et al,. 2021) which shows that there is an influence of resilience and habits of mind on critical thinking abilities. The magnitude of the influence of resilience and habits of mind on critical thinking abilities is 75.3%. In the learning process, especially in mathematics learning, resilience and habits of mind are very important for students to have because with the resilience and habits of mind they have, they tend to be able to solve mathematical problems well, while students who have low resilience and habits of mind will quickly give up. and have bad thinking habits in working on computational thinking problems.

Computational thinking is a series of processes carried out creatively in applying problem solving which includes ideas, challenges and opportunities encountered in order to develop the chosen solution (Fajri et al., 2019). Mufidah (2018) explains that if students can get used to implementing computational thinking skills to solve problems in everyday life, then these students will think more critically in solving problems effectively and efficiently. So resilience is needed, which is a dynamic process that connects the role of various individual and social or environmental factors, which reflects a person's strength and resilience to recover from negative emotional experiences when facing difficult situations that are stressful or contain significant obstacles (Hendriani 2018). Habits of mind are students' experiences in the learning process, their habits will appear to change, learning habits arise due to the process of decreasing response tendencies by using repeated stimulation (Aringga *et al*., 2020). Therefore, students who study at school will

have certain habits as a result of their learning process at school.

CONCLUSION

The conclusion section must be in the form of a paragraph that answers the purpose of the study. Tells how the work of researchers can advance the latest knowledge but does not seem to discuss. Conclusions do not repeat the results that have been displayed in the abstract, or only contain points of experimental results. Provide a clear scientific justification of the research work and indicate possible applications and extensions. If needed, make suggestions for future research.

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