

The Influence of Student Stress Levels and Student Mobile Technology Acceptance Levels on Student's Academic Performance

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ABSTRACT

One way to measure education quality is to evaluate students' learning outcomes. Therefore, this study aims to determine the effect of student stress levels and mobile technology acceptance levels on their learning outcomes. This research method used two methods, namely the Chi-Square method and the correlation method. The Chi-Square method tests the following hypotheses: (a) is there a significant effect between student stress levels and their learning outcomes? (b) is there a significant effect between students' mobile technology acceptance level and learning outcomes? Meanwhile, the correlation method used to test the hypothesis is as follows: (c) is there a significant correlation between the stress level of students and their learning outcomes? Moreover, (d) Is there a significant correlation between students' mobile technology acceptance level and learning outcomes? The Chi-Square results for testing hypothesis (a) show that there is a significant influence between the stress level of students and student academic performance. The Chi-Square results for testing hypothesis (b) show no significant effect between the level of mobile technology acceptance and student academic performance. The correlation result for testing hypothesis (c) shows a significant negative correlation between student stress levels and academic performance. The correlation result for testing hypothesis (d) shows a significant positive correlation between the mobile technology acceptance level and students' academic performance

1. INTRODUCTION

One way to improve education quality is to evaluate students, especially learning outcomes. Can students keep their learning outcomes reasonable and increase or even decrease? One of the factors causing the decline in student learning outcomes is stress. This stress can be a severe emotional response due to internal or external changes (Alharbi & Smith, 2018). Stress can also occur in the learning process in an educational institution. In the learning process, stress can occur, such as giving a lot of learning material, excessive assignments, and examinations that are difficult for students to work on, which can cause stress on students (Deb et al., 2014). Excessive stress can affect physical thoughts and student learning outcomes (Feld & Shusterman, 2015).

Stress is divided into internal and external parts (Raufelder et al., 2014). At the same time, the causes of stress or stressors can be caused by social, academic, and physical problems. This research focuses on academic stress. Academic stress is a condition in which students have academic demands on their capacities, thereby stimulating helplessness and difficulties in adaptation and self-actualization (Chraif, 2015; Kim et al., 2016). Academic stress can be triggered by an extensive academic load, insufficient time to complete assignments, and inappropriate self-expectations (Calaguas, 2012; Kariv et al., 2005).

Mobile technology is needed to relate to social life and business transactions in the business world (Brown & Mbatii, 2015). In education, mobile technology has been widely used to assist in learning processes such as online and blended learning (Biloš et al., 2017). The application of mobile technology-based learning has been widely used, such as for learning English (Lai et al., 2022), chemistry learning (Díaz-Sainz et al., 2021), and STEM (Science et al.) learning (Mutambara & Bayaga, 2021). The application of this mobile technology can help make it easy for students to access learning materials, collect assignments, and take exams (Han & Shin, 2016).

The studies that have been carried out are limited to measuring student stress and have yet to discuss much and link it to the level of mobile technology acceptance of students. Therefore, this study aims to determine the effect of student stress levels and mobile technology acceptance levels on learning outcomes. The hypothesis of this study such as:

- a. Is there a significant influence between students' stress levels on student performance?
- b. Is there a significant influence between mobile technology acceptance and student performance?
- c. Is there a significant correlation between students' stress levels and performance?
- d. Is there a significant correlation between mobile technology acceptance level and student performance?

2. ACADEMIC STRESS AND TECHNOLOGY MOBILE

2.1. Aspects of Critical Thinking

Some students who have just entered college usually experience stress when starting lectures. Due to changes in the learning environment, adaptation to a new atmosphere, and meeting other students to communicate well. In general, the types and causes of academic stress consist of biological and psychosocial factors. Meanwhile, psychosocially, it consists of cognitive, emotional, and social behavioral components (Karyotaki et al., 2020; Liu, 2015). Therefore, students should be able to adjust to these conditions immediately. Some of the causes of academic stress include overloaded assignments to students, lack of time to do the assignments given, lack of time to review what has been learned, too much material to study,

feelings of discomfort because they cannot answer questions given by lecturers, exams which is too difficult to solve (Bedewy & Gabriel, 2015).

Implementation of mobile technology has been widely used in education. Mobile technology has been widely used in learning processes such as mobile learning, hybrid learning, and online learning (Jun & Choi, 2015). Mobile technology used in mobile learning has several advantages, such as increasing student inquiry due to the media's attractiveness and students exploring more material in mobile learning (Becker et al., 2020). Implementation of mobile technology in the form of mobile learning can train and develop several skills, such as critical skills, explorative skills, and inquiry skills (Nikolopoulou, 2018).

3. METHODS

3.1. Sample

The sample for this study was Electrical Engineering students at Universitas Negeri Surabaya for the 2022/2023 academic year who took probability and statistics courses. The sample was obtained by sending a questionnaire online via Google form to 66 students. Only 50 students completed the questionnaire correctly, which could be processed.

3.2. Instrument

This study adopted the Medical Student Stressor Questionnaire (MSSQ) instrument. The MSSQ instrument was created and developed by (Yusoff et al., 2010) to measure the stress level of medical students. In this study, the MSSQ was adopted only in the Academic Related Stressor (ARS) domain and removed an indicator related to the medical field. The purpose of deleting this indicator is so that the ARS instrument can be used for students with non-medical educational backgrounds. The ARS instrument uses a 0-4 scale. The stress level is divided into four levels, such as Mild (0.00 – 1.00), Moderate (1.01 – 2.00), High (2.01 – 3.00), and Severe (3.01 – 4.00). Table 1 indicates the ARS indicators and their assessment.

Table 1. The academic-related stressor indicators and their assessments

No	Academic Related Stressor (ARS) Indicators	Scale (0-4)
1	Test/examinations	
2	Quota system in examinations	
3	Need to do well (self-expectation)	
4	Heavy workload	
5	Falling behind in reading schedule	
6	Learning context-full of competition	
7	Having difficulty understanding the content	
8	Getting poor marks	
9	Lack of time to review what has been learned	
10	Unable to answer the question from teachers	
11	There is a large amount of content to be learned.	
12	Unjustified grading process	

This research uses the Mobile Technology Acceptance (MTA) instrument developed by (Boticki et al., 2015). MTA measurements use a scale of 0-4. This study divides the MTA level into four levels: Novice (0.00 – 1.00), Intermediate (1.01 – 2.00), Advanced (2.01 – 3.00), and Expert (3.01 – 4.00). Table 2 shows the MTA indicators and their assessments.

Table 2. The mobile technology acceptance indicators and their assessments

No	Mobile technology acceptance	Scale (0-4)
1	I would find mobile learning helpful.	
2	Using mobile learning enables me to accomplish learning activities more quickly.	
3	Using mobile learning increases my learning productivity.	
4	If I use mobile learning, I will increase my chances of getting a better grade.	
5	My interaction with mobile learning would be clear and understandable.	
6	It would be easy for me to become skillful at using mobile learning.	
7	I would find mobile learning easy to use	
8	Learning to operate mobile learning is easy for me.	
9	When using mobile learning, I do not realize that time has elapsed.	
10	When using mobile learning, I will forget the work I must do	
11	Using mobile learning will give me enjoyment.	
12	Using mobile learning will stimulate my curiosity.	
13	Using mobile learning will lead to my exploration.	

The student academic performance instrument was developed by changing the 0-100 value to a 0-4 scale, as shown in Table 3

Table 3. The scaling of students' academic performance

No	Student's Academic performance (0-100)	Student's Academic Performance (0-4)
1	86-100	4.00
2	80-85	3.75
3	75-79	3.50
4	70-74	3.00
5	65-69	2.75
6	60-64	2.50
7	55-59	2.00
8	40-54	1.00
9	0-39	0.00

4. RESULTS AND DISCUSSION

4.1. Level of Stress vs Student Performance

Table 4 shows the crosstab between students' stress levels and student performance. The mild stress level is 23 students. the moderate stress level is 26 students, and the high- stress level is one student. The Chi-Square results in Table 5 show that the asymptotic significance value is 0.001. It shows less than the value α (0.05), so the null hypothesis is rejected, and the alternative hypothesis is accepted, namely that there is a significant relationship between students' stress levels and academic performance.

Table 4. The crosstab between students' stress levels and academic performance

		Students Performance				Total
		2.50	3.00	3.25	3.50	
Level of Students' Stress	Mild Stress	0	3	14	6	23
	Moderate Stress	0	6	20	0	26
	High Stress	1	0	0	0	1
Total		1	9	34	6	50

Table 5. The results of the chi-square test for students' stress levels and academic performance

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	58.066 ^a	6	.000
Likelihood Ratio	20.022	6	.003
Linear-by-Linear Association	10.972	1	.001
N of Valid Cases	50		

4.2. Mobile Technology Acceptance vs Student's Academic Performance

Table 6 shows the crosstab between students' mobile technology acceptance levels and academic performance. Table 6 shows three students at the intermediate level, 25 at the advanced level, and 22 at the expert level. Table 7 shows the results of the chi-square test. Table 7 shows that the asymptotic significance value is 0.512. The null hypothesis is accepted because it is greater than the value α (0.05). That is, there is no significant effect between the level of mobile technology acceptance and students' academic performance.

Table 6. The crosstab between students' mobile technology acceptance levels and academic performance

		Students Academic Performance				Total
		2.50	3.00	3.25	3.50	
Technology	Intermediate	0	1	1	1	3
Mobile	Advanced	1	6	16	2	25
Acceptance	Expert	0	2	17	3	22
Total		1	9	34	6	50

Table 7. The results of the chi-square test for students' mobile technology acceptance levels and academic performance

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.249 ^a	6	.512
Likelihood Ratio	5.507	6	.481
Linear-by-Linear Association	1.274	1	.259
N of Valid Cases	50		

4.3. Correlation

This research used the Pearson Correlation method for the correlation test. Table 8 shows that mobile technology acceptance with students' academic performance has a Pearson Correlation value of 0.437. This is significant because the significance value (2- 2-tailed) is 0.0001 and is smaller than the value α (0.01). Therefore, it can be stated that there is a positive correlation between mobile technology acceptance and students' academic performance. The more positive the value of the mobile technology acceptance level, the greater the level value of students' academic performance.

Meanwhile, the students' stress level has a Pearson Correlation value of -0.367, which is significant because the significance value (2- 2-tailed) is 0.001 and is smaller than the value α (0.01). Therefore, it can be stated that there is a negative correlation between the level of students' stress and students' academic performance. The more negative the stress level value, the lower the students' academic performance level value.

Table 8. The correlation between mta level, students' stress level, and students' academic performance

		Level Mobile technology acceptance	Level Student Stress	Students' Academic Performance
Level Mobile technology acceptance	Pearson	1	-.213	.437**
	Correlation			
	Sig. (2-tailed)		.051	.000
	N	85	85	85
Level Students' Stress	Pearson	-.213	1	-.367**
	Correlation			
	Sig. (2-tailed)	.051		.001
	N	85	85	85
Students' Academic Performance	Pearson	.437**	-.367**	1
	Correlation			
	Sig. (2-tailed)	.000	.001	
	N	85	85	85

** . Correlation is significant at the 0.01 level (2-tailed).

4.4. Discussion

This study provides important insights into the correlation between student stress levels, mobile technology acceptability, and academic success. The statistics indicate a negative association between stress levels and academic performance, aligning with established beliefs about stress and cognitive function. According to (Leslie et al., 2021), stress occurs when individuals see their academic expectations surpassing their ability to manage them. This corresponds with the noted negative link, wherein increased stress diminishes pupils' capacity to concentrate, remember knowledge, and perform proficiently in academic environments. Support (Muluneh & Bejji, 2024) demonstrates that stress affects cognitive load, diminishing working memory capacity, which accounts for the decreased academic performance observed in students with elevated stress levels.

On the other hand, the positive relationship between mobile technology acceptability and academic performance emphasizes the importance of digital tools in improving learning. The Unified Theory of Acceptance and Use of Technology (Suo et al., 2021) developed by Venkatesh proposes that performance expectancy, which may be defined as the belief in the usefulness of technology, plays an essential part in the acceptance of technology. Our research demonstrated that students with greater acceptance of mobile technology reported superior academic results. It is likely attributable to the simplicity of accessing learning materials, organizing academic assignments, and facilitating communication through mobile platforms. Similar research conducted by (Paul, 2021; Rashid & Asghar, 2016) and (Heflin et al., 2017) has demonstrated that integrating mobile technology into educational environments can improve academic outcomes by increasing student engagement, self-regulation, and productivity. This research emphasizes the significance of promoting the adoption of mobile technology in educational settings and managing academic stress. Interventions such as mindfulness can significantly enhance student performance by reducing stress (González-Martín et al., 2023; Indriaswuri et al., 2023; Parsons et al., 2022). Likewise, time management training can significantly enhance student performance by reducing stress (Ahmady et al., 2021; Alyami et al., 2021; Häfner et al., 2015). Additionally, promoting efficient and flexible learning strategies could improve academic outcomes by nurturing a greater degree of mobile technology acceptance through training or increased familiarity. The interaction between these two variables—stress and technology acceptance—in determining academic performance is what makes these results particularly intriguing. Although there is a correlation between high stress and decreased performance, pupils who are more proficient in using mobile technology can alleviate some of these adverse effects. Future research may explore if using mobile technology alleviates the adverse effects of stress, potentially equipping instructors with a resource to assist stressed students.

5. CONCLUSION

This study's results show that student stress levels significantly influence academic performance, while mobile technology acceptability positively correlates with academic performance. The results underscore the necessity for educational institutions to devise strategies that promote the effective integration of mobile technology to improve learning outcomes and resolve student stress. Future research could investigate the long-term effects of mobile technology use on student performance in diverse educational settings and examine interventions to mitigate stress, thereby contributing to the development and sustainability of educational practices.

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