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Analysis of Academic Stress Measuring Instruments in Students

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Abstract

This study develops a measuring tool for student academic stress that refers to the theory of Gadzella & Masten (2005), with a focus on measuring academic stress that is relevant to student characteristics. A total of 146 students from various departments and semester levels participated in this study. The measuring instrument developed consists of 14 items designed based on the concepts outlined in the theory. Several stages of testing are carried out to ensure the validity and reliability of the measuring instrument. The results of the analysis showed that out of the 14 items that were prepared, 1 item was found to have low discriminatory power and had to be removed from the measuring instrument. These results are consistent with efforts to ensure that the measuring tool only creates an item that can effectively differentiate the level of academic stress experienced by students. The 13 items of the measure show the uniqueness of the measurement that is relevant to the characteristics of the student. The implications of these findings contribute to the understanding and handling of academic stress at the university level. Further studies are expected to validate this measure in a broader population as well as identify other factors that influence academic stress.

Keywords: Academic Stress, Measuring Tool Development, Students

Introduction

Many individuals experience academic stress or pressure in learning. The phenomenon of academic stress is one of the common problems among students, especially in a competitive educational environment (Hidayat & Darmawanti, 2022). This involves a high level of pressure experienced by students due to academic demands such as exams, assignments, presentations, and high expectations from various parties such as lecturers, parents, and even themselves (Arlinkasari & Akmal, 2017). Students are those who follow a higher education

format consisting of academic institutions, vocational schools, high schools, institutes, and universities. The main task as a student is to carry out, participate in and complete academic activities on time while studying at the university. Students not only do academic work but also carry out non-academic activities such as working continuously and efficiently so that they become fully mature human beings (Indriyani & Handayani, 2018).

Academic stress can have a negative impact on students' mental and physical well-being such as anxiety, depression, sleep disturbances, and decreased academic performance (Yusriyyah, 2020). This is often triggered by factors such as lack of time for rest, perception of success, uncertainty about the future, and lack of social support. This phenomenon shows that students' mental well-being requires more attention and the implementation of strategies to overcome academic stress. This is often triggered by factors such as lack of time for rest, perception of success, uncertainty about the future, and lack of social support.

Academic stress that occurs in students must be considered because it affects the student education process. Students do not give up easily because of the obstacles they face, but continue to continue the learning process and complete lecture assignments. Work feels easy and enjoyable when you complete tasks according to your skills and interests. This will help students not to give up easily and still complete the assignment as well as possible. Zuama's research (2014) shows that students from semester 1 to semester 8 (final semester) tend to experience stress easily. Stress experienced by students includes low GPAs, curriculum that is considered too heavy, changes in the curriculum, strict academic regulations in universities, the obligation to complete assignments according to deadlines, obstacles in completing final projects, and demands from parents (Gatari, 2020).

Literature Review

Academic stress is a psychological reaction that occurs in a person to feel an imbalance between academic demands and abilities in individuals that can lead to academic achievement. According to (Siregar & Putri, 2020) belief in a person's ability to meet academic requirements can increase efforts to achieve the desired goal, but it can also cause obstacles in the process of achieving the goal. Academic stress is a condition when a person feels unable to meet academic requirements and considers the academic requirements he receives as a distraction and a stress trigger (Academic & Final, 2023).

According to Gadzella & Masten (2005) academic stress is an individual's perception of academic stressors and reactions to them, which includes physical, emotional, behavioral, and cognitive reactions. according to Sarafino & Smith define academic stress as a condition of stress that occurs due to a mismatch between academic demands and individual abilities. Jiandong Sun stated that academic stress occurs when the capacity of students is not proportional to the academic demands given. Santrock (2003) explained that stress is a person's response to an event that triggers stress that cannot be overcome by the individual. Desmita (2010) also mentioned that academic stress is a student's response to school demands that cause feelings of discomfort, tension and behavior changes.

Gadzella & Masten (2005) measured academic stress in two components, namely academic stressors and reactions to academic stressors:

a. Stressor akademik

Academic stressors are events or situations (stimulus) that require adaptation in daily life apart from normal things. Academic stressors can be divided into 5 categories, namely:

1. Frustrations, occurs when a person experiences a delay in achieving goals or when personal needs are hindered so that they cannot achieve life goals. The causes of frustration can be procrastination, failure, daily difficulties, lack of

resources, not being accepted into the environment social, and lost opportunities or opportunities.

2. Conflicts, related to the difficulty and pressure to choose between two or more things, including conflicts between two desirable, or undesirable choices, or between positive and negative choices.

3. Pressure, related to competition and academic stress comes from both outside and within, as well as competition. Workloads that Excessive can cause stress. Pressure can accelerate or slowing down performance.

4. Changes, which is a change in behavior that occurs due to Various factors such as unpleasant experiences, many changes that occur simultaneously and life changes that disturb the individual.

5. Self-imposed (self-imposed desire), related to one's desire and emphasizing herself to compete, wanting to be loved by everyone, Easily worry about everything, be able to solve problems, and feel anxious.

b. Reactions to academic stressors

In addition to academic stressors, the second component in measuring academic stress is the response to academic stressors. Stress reactions consist of four categories, namely:

1. Physiological (physiological reaction) is characterized by excessive sweating, body shaking, stuttering speech, rushed movements, fatigue, difficulty breathing, back pain, skin reactions, arthritis, headache, weight loss or gain.

2. Emotional (emotional reaction) is characterized by feelings of fear, anger/anger, guilt, and sadness.

3. Behavioral (behavioral reactions) characterized by crying, hurting/self-destructing

own and others, irritability, suicide attempts, self-defense mechanisms and loneliness.

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4. Cognitive Appraisal, which refers to experiences that cause stress in students and when a person makes an assessment of stressful situations and produces strategies to cope with stress.

Research Methods

The source of this research was obtained from 146 respondents from students who were experiencing academic stress. This measuring tool was distributed using a questionnaire with an academic stress scale with a likert scale model with 5 answer options, namely, 1 Very Not Suitable (STS), 2 Not Suitable (TS), 3 Neutral (N), 4 Suitable (S), 5 Very Suitable (SS). Respondents were adjusted to the characteristics of being active as students, the respondents were given an academic stress measurement scale consisting of 14 items. The data collected from the measurement results were analyzed using the discriminatory power and confirmatory analysis approach. The power of discrimination is carried out to remove items that are not correlated and confirm to find items that are relevant to the subject in the phenomenon.

No	**Aspek**		**Indikator**		**Aitem**		**Jumlah**
1	Stressor Akademik	*Frustrations*	1. 2.	Delay in achieving goals Feeling isolated in the community	1.	I was frustrated because of the achievement of my goals I'm hampered	2

				2. I am not accepted into the campus social environment	
	Conflicts	1. Conflict between the positive and negative sides of a choice	1.	I experienced conflict, namely the negative side I experienced pressure because of the demands as a student and the positive side I was able to do something on time	1

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	Pressures	1.	Expectations from family or others	1.	The expectations of my family for me made me feel depressed	2
		2.	Too much workload	1.	I feel pressured by the burden of too much college work	
	Changes	1.	Many changes at the same time	1.	I experienced a lot of changes at the same time while in college	1
	Self-imposed	1.	Procrastination	1.	I like to procrastinate in	1

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					Complete coursework	
2	Reactions to academic stressors	*Psychological*	1. Excessive sweating	1.	When I experienced a stressful situation on campus, I sweated a lot	1
		Emotional	1. Feeling scared 2. Feeling upset/angry	1. 2.	I felt scared when I had a hard time studying I feel annoyed when I have trouble going to college	2

	Behavioral	1. Cry 2. Irritability 3. Self-harm	1.	In the face of a stressful situation on campus, I cried	3
			2.	In the face of stressful situations on campus, I became irritable	
			3.	In the face of stressful situations on campus, I hurt myself	
	Cognitive	1. Analysta a. Problems experienced	1.	I thought and menganalisa	1

	Problems I experienced on campus	
Total		**14**

Results and Discussion

The results of this study show that the developed academic stress measurement tool has adequate validity. From 14 items to 13 items left after the discrimination power test, they were able to measure academic stress accurately and consistently. The results obtained illustrate that the compiled measuring tool provides a clear view of the compatibility of the measuring tool with the underlying concept, this study makes an important contribution to the development of a valid and reliable measuring tool to measure academic stress in students.

Table.2 Consistency Statistics

Estimate	**Cronbach's α**	**Average interitem correlation**
Point estimate	0.840	0.265
95% CI lower bound	0.799	0.198
95% CI upper bound	0.874	0.328

Data was obtained from the results of the measurement involving 146 respondents.

The results of the Cronbach alpa analysis test conducted by the researchers using JASP software obtained a point estimate of 0.840, the results showed that 16 items were used by reliable pins.

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Table.3 Statistical reliability if an item is discriminated against

Item	If item dropped Cronbach's α
V1	0.826
V2	0.838
V3	0.823
V4	0.828
V5	0.816
V6	0.841
V7	0.836
V8	0.830
V9	0.818
V10	0.823
V11	0.822
V12	0.826
V13	0.835
V14	0.849

The results of this analysis show that between the estimate point and Cronbach the superiority of a measurement and the stability of the measurement. For a measuring tool, if the value of a measuring tool has a value greater than the estimated point, then the item is not feasible or unreliable. So that the item can be abolished or eliminated, but if an item has a value smaller than the estimate point, the item can be maintained and is suitable for use. Testing using cronbach alpha values must have a value greater than 0.6 (Darmawan & Mardikaningsih, 2021). In the output of JASP, it shows an estimate point of 0.840 where of the 14

items the researcher has 2 items above the estimate point, namely in the 6th item = 0.841 and the 14th item = 0.849 where the item is not in accordance with the estimate point, but the 12 items in the study have suitability and validity and reliability to measure the variable to be measured.

Table.4 Chi-squared calculation results

	Value	df	p
Model	197.221	77	< .001

The results of the Chi-squared Test above show that academic stress in students has a significant relationship and show that academics can cause stress in students.

Table.5 Component Loadings RC1 & Uniqueness

	RC1	Uniqueness
V11	1.050	1.008
V5	1.004	0.636
V9	**0.910**	**0.644**
V12	0.782	0.866
V3	0.781	0.760
V10	**0.763**	**0.658**
V4	0.750	1.056
V1	0.714	0.837
V8	0.686	1.102
V7	0.601	1.309
V13	0.519	1.016

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Table.5 Component Loadings RC1 & Uniqueness

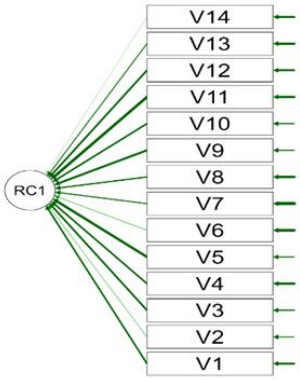
	RC1	Uniqueness
V2		0.545
V6		1.110
V14		0.923

Note. Applied rotation method is promax.

Uniqueness = 0.6 (items 9 and 10)

In this study, there are 2 items, namely item 9 and item 10 which have a score of 0.6 so that it can be said to be valid and reliable because the item is not the same as other items that must have a score above 0.6 in measuring a variable.

Fig.1 Path diagram of 14 measurement items



From the RC1 path diagram, there is 1 measurement item whose strength is not optimal to measure student academic stress. There are also 13 measures that are lacking that are appropriate to measure students' academic stress.

Table.6 Fit indicator measurement measures

Metric	Value
Root mean square error of approximation (RMSEA)	0.125
RMSEA 90% CI lower bound	0.108
RMSEA 90% CI upper bound	0.143
RMSEA p-value	8.187×10^{-12}
Standardized root mean square residual (SRMR)	0.111
Hoelter's critical N (α = .05)	57.384
Hoelter's critical N (α = .01)	63.274
Goodness of fit index (GFI)	0.953
McDonald fit index (MFI)	0.546
Expected cross validation index (ECVI)	

RMSEA

Steiger and Lind (1980) proposed in (Efendi & Purnomo, 2012) that RMSEA is one of the infomative indices in SEM. An RMSEA value of < 0.05 indicates a *close fit*, while a value between 0.05 < RMSEA < 0.08 indicates *a good fit*. The above results show that the RMSEA result is 0.125, this shows that the RMSEA point should not be greater than 0.08 or less than 0.05, indicating that the parameters of the measurement model made are unacceptable. If the RMSEA points are among those points, then the research measurement model is said to be acceptable.

SRMR

Similarly, for the research measurement model to be reliable, the SRMR should not be less than 0.05. In this study, the SRMR measurement model is 0.111 higher

than the standard point of SRMR so that this measurement is reliable and has high reliability.

GFI

In the Efendi & Purnomo study, 2012 It is recommended for the feasibility of a model to have a GFI value greater than 0.90 and its maximum value is 1. A GFI value of > 0.90 indicates *a good fit* , while a GFI of 0.80 < <0.90 is often referred to as *a marginal fit*. The GFI value above shows 0.953 which means fit because it is 0.95 < 1.00.

In this study, we used correlation coefficient analysis to evaluate the relationship between variables whose values ranged from -1 to 1. The test results showed that there was a relationship between the academic load of students who were strengthened and a significant score at a certain p level. Furthermore, a reliability analysis was carried out using Cronbach Alpha and an estimation point of 0.840 was obtained which showed that the measuring tool used was reliable (Barbayannis et al., 2022).

However, there are some items with values above or below the estimation point that require further attention. The results of the analysis of the measurement model show that most of the measurement items of students' academic stress variables are valid and reliable. However, there is one measurement item whose strength is not optimal and there is a difference between the RMSEA value and the specified limit value, which indicates a model mismatch. Thus the SRMR value indicates reliable measurement and the GFI value indicates conformity with the model. Although some aspects still need improvement, overall this measuring tool is reliable and has a high level of reliability in measuring student academic stress.

Conclusion

The conclusion of this study shows that there is a significant relationship between academic load and student stress, with the analysis of the coefficient of

coordination showing a significant value at a certain level of p. The measuring instrument used has high reliability with *a Cronbach Alpha value* of 0.840, but there are several items that are given further attention because the reliability value varies. The results of the analysis of the measurement model show that most of the items are valid and reliable, although there is one item that is not optimal. In addition, the RMSEA value indicates a model mismatch, although SRMR indicates reliable measurements and GFI corresponds to the model. Overall, this measuring tool is reliable for measuring students' academic stress, but improvements need to be made in some items to improve the accuracy and suitability of the measurement model. As a suggestion, it is recommended to review and improve items that show varying reliability in order to improve the overall reliability of the measuring instrument. The use of additional analyses such as confirmatory factor analysis (CFA) can help in ensuring the validity of the construct and improving the conformity of the model. In addition, it is important to conduct follow-up trials with larger and more diverse samples to ensure the generalization of the findings of this study.

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