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Self-Regulated Learning and Academic Stress of Islamic School Students: Mediating Effect of Student Engagement

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ABSTRACT

Students in Islamic schools often experience academic stress due to the demands of studying general subjects and religious subjects. Self-regulated learning and student engagement are important to help students manage stress and optimize learning outcomes. The purpose of this study was to test the indirect effect of student engagement in mediating self-regulated learning on academic stress in students. This study used a saturated sample of 154 students who were analyzed quantitatively by testing the outer model and inner model with the SmartPLS application. The measuring instruments used were a modification of the Student-Life Stress Inventory (SLSI) scale (α = 0.989), a modification of the Student Engagement in School Questionnaire (SESQ) scale (α = 0.983), and a modification of the Assessing Academic Self-Regulated Learning scale (α = 0.988). The results of the inner model analysis showed that self-regulated learning had a significant effect on academic stress (β = 0.026; T = 2.239; P = 0.026), and student engagement entered as a mediator of the effect of self-regulated learning on academic stress remained significant (β = 0.023; T = 2.617; P = 0.009), which means it mediates partially. The R-Square results of self-regulated learning together with student engagement on academic stress showed a value of 0.994, which means that 99.4% of self-regulated learning and student engagement affect academic stress. The implication for Islamic schools is the importance of increasing self-regulated learning and student engagement to help students reduce academic stress by implementing student-centered learning strategies.

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INTRODUCTION

Adolescents are faced with various pressures while carrying out their developmental tasks. In terms of cognitive development, adolescents begin to develop critical thinking skills and analyze abstract concepts such as morality, justice, and human rights (Nippold et al., 2020). However, this ability also encourages them to question the rules or norms that apply more often, which has the potential to cause conflict with parents or teachers (Hurlock, 1983).

Adolescents in Islamic-based schools have different academic and non-academic experiences than adolescents who attend public schools. Students in Islamic schools face longer learning durations, more subjects, and demands to achieve, both in academic fields such as participating in competitions and in non-academic fields such as memorizing 30 juz of the Qur'an. This can be a source of academic pressure for some students (Fahmi & Widyastuti, 2018; Khafifah et al., 2023). Students often experience confusion in determining priorities between religious studies and general subjects due to conflicts of interest from the many subjects that must be studied (Khafifah et al., 2023). Students in Islamic schools face higher risks of mental health problems, including Post-Traumatic Stress Disorder (PTSD) and depression, due to stress and unique living conditions (Nurina & Hermatasiyah, 2022).

Students in Islamic schools are required to balance academic studies and religious education. This combination can create a heavy cognitive load, which can lead to fatigue and confusion in time management (M. Suud & Na'imah, 2023). Rapid emotional changes during adolescence, coupled with academic and social pressures, can lead to anxiety and other mental health problems. Students feel anxious about their academic performance or social relationships (Fahrezi et al., 2024).

The results of a preliminary study conducted through interviews with supervising teachers and students also found several symptoms of academic stress problems in junior high school students. Madrasah Tsanawiyah students often experience academic stress originating from schoolwork and organizations, as well as demands to memorize the Quran, which triggers anxiety and health problems such as headaches and disturbed appetite (Mayya et al., 2022; Zamroni, 2019). The inability to manage this pressure impacts declining student learning achievement and mental health (Trevethan et al., 2022).

Some of these findings differ from Shi's (2020) findings, which state that boarding schools can have a positive impact on academic performance, especially in mathematics. In addition, this environment encourages focused learning, structured routines, and access to academic resources, which contribute to better outcomes for students. Franck et al. (2020) also found that boarding schools can improve students' social and emotional skills, such as conflict management and group work.

Although some studies have shown the positive effects of boarding schools on

academic performance and social skills (Shi, 2020; Franck et al., 2020), there is a gap regarding the dual demands of mastering general and religious subjects. The importance of research on academic stress in Islamic schools is crucial because students in these schools are faced with a unique burden, namely balancing general and religious education, which risks increasing cognitive and emotional burdens. Research on academic stress will help fill the existing evidence gap, namely how the burden of studying strengthens academic stress.

Academic stress is one type of stress that occurs in the educational environment (Adom et al., 2020) and arises due to internal and external factors. Social stress theories explain that social structures, relationships, and roles contribute to stress (De Villiers, 2003). Therefore, academic stress can be understood as pressure caused by the interaction between academic demands and the individual's ability to meet them, which is exacerbated by social factors.

Academic stress is related to learning, which includes pressure to advance to the next class, long study hours, cheating, numerous assignments, obtaining test scores, bureaucracy, gaining scholarships, and making decisions about majors and careers, as well as exam anxiety and time management (Yusuf & Yusuf, 2020). Various demands and pressures can cause academic stress: physical, such as psychosomatic symptoms; cognitive, such as perceptions of heavy tasks; affective, such as feeling pressured by parents; and social, such as competition among peers (Novianti & Mariyati, 2023). This stress arises as a response to the burden or demands that are excessive in learning, the pressures that occur within students due to competition, or academic demands (Barseli et al., 2017).

In addition, factors that can cause academic stress come from internal sources, including resilience (Trigueros et al., 2020) which increases an individual's ability to overcome challenges, reduces the impact of academic stress, and enhances adaptation to environmental pressures (de la Fuente et al., 2020). They found that self-regulation and external regulation in the form of learning can affect students' academic stress. Self-regulation helps students manage emotions and time, while external regulation through learning provides structural support that can reduce stress. However, research by Febriana & Simanjuntak (2021) found different results, showing that self-regulated learning significantly affects academic stress in Indonesia.

Research in Indonesia has empirically proven that motivation, self-efficacy, grit, hardiness, and student engagement can reduce academic stress (Mulya & Indrawati, 2017; Sagita et al., 2017; Pratiwi et al., 2023; Putri & Sawitri, 2017; Awal & Kusdiyati, 2023). In addition, Simonelli-Muñoz et al. (2018) noted that other factors outside the individual that affect academic stress include family and friendships. Many variables affect academic stress, but the importance of self-regulated learning (SRL) research cannot be ignored. Self-regulated learning allows students to regulate their learning processes independently, develop effective strategies, and increase motivation and responsibility (Vosniadou, 2020; Heaysman & Kramarski, 2022). When students' SRL levels are high, they are

better able to manage time and academic tasks, thereby reducing feelings of stress due to academic burdens (García-Ros et al., 2023).

In the learning process, there are often demands and pressures that can cause academic stress, so students need to have self-regulated learning in order to adjust learning methods according to their abilities and manage time well so that the risk of academic stress can be minimized (Candra & Rani, 2022). Self-regulated learning is a series of directed planning actions to achieve predetermined targets or goals (Zimmerman, 1989). Zimmerman's Social-Cognitive Model of self-regulated learning (SRL) explains how students regulate their learning process through three phases, namely: 1) the preparation phase in the form of task analysis and strategy planning activities; 2) the implementation phase, which includes self-control and self-observation when working on assignments; and 3) the reflection phase, which encourages students to evaluate the results and strategies used, allowing them to make adjustments to improve future results (Winne & Hadwin, 2010).

Students who have self-regulated learning are more likely to succeed academically because they can manage their learning process effectively, attend classes regularly, participate in discussions, and use strategies to understand the material. Students feel that learning is beneficial to themselves, thus increasing student engagement (Ellis & Helaire, 2018). Mukaromah et al. (2018) also stated that self-regulated learning is an important variable that influences student engagement in learning.

In the framework of Self-Determination Theory (SDT), student engagement is understood as the result of motivation driven by basic psychological needs, namely autonomy, competence, and social relationships. Student engagement in the context of SDT includes three main components: 1) behavioral engagement, namely effort, and persistence in academic tasks; 2) emotional engagement, which involves positive emotions; and 3) cognitive engagement, including the use of active learning strategies and self-regulation to learn deeply (Reeve, 2012).

The level of student engagement in academic activities can function as a protector from stress. Low student engagement is associated with low intrinsic motivation to learn, which can lead to increased academic stress (Suud et al., 2023). Conversely, students who are actively involved and motivated tend to face academic challenges better (Manikandan & Neethu, 2018). Student engagement is directly related to academic achievement and serves as an intervening factor (Konold et al., 2018).

It can be concluded that SRL helps students develop skills to overcome academic challenges independently (Suud et al., 2024). When students are able to manage time, set goals, and choose effective learning strategies, they feel more in control of academic situations. Student engagement serves as a mediating mechanism that links SRL to reduced academic stress because students who are actively involved in learning are better able to manage academic demands positively. Therefore, this study aims to empirically test the mediating effect of student

engagement on the relationship between self-regulated learning and academic stress. Figure 1 illustrates the conceptual framework of the variables studied.

Figure 1. Research Variable Framework

METHODS

This study used a quantitative approach to examine the effect of self-regulated learning on academic stress mediated by student engagement in Islamic schools in Banyumas, Indonesia. The study population consisted of 154 students from one of the Islamic schools in Banyumas, Central Java, encompassing grades seven, eight, and nine, with an age range of 12 to 16 years. Non-probability sampling with a saturated sample method was applied, which is a sampling technique in which the entire population is used as a sample because the population size is relatively small. This technique was chosen because in exploratory research, or when the focus is on specific cases, the entire population should be included to gain more comprehensive insights (Creswell, 2014). For more detailed data, see Table 1.

Table 1. Demographic Data of Research Participants

Criteria	N	Percentages (%)
Age		
12	25	16,23
13	43	27,92
14	44	28,57
15	34	22,08
16	8	5,19
Gender		
Male	81	53,60
Female	73	47,40
Grade		
VII	53	34,42
VIII	58	37,66
IX	43	27,92

Notes: N=154

Data Collection Method

The collection of quantitative data in this study used a Likert scale made in the form of closed statements to measure the attitudes, opinions, and perceptions of a person or group of people regarding an event (Sugiyono, 2013). The data were collected using a printed questionnaire containing three scales: Student-Life Stress Inventory (SLSI), Assessing Academic Self-Regulated Learning, and the Student Engagement in School Questionnaire (SESQ), which were modified to suit the research participants.

Academic stress was measured using the Student-Life Stress Inventory (SLSI) scale, which refers to Gadzella's (1994) aspects. This scale is used to see symptoms

of academic stress in students through two aspects: academic stressor aspects, with five categories of frustration, conflicts, pressure, chance, and self-imposed; and the reaction aspect to academic stressors, with four categories, namely cognitive appraisal, physiological, behavioral, and emotional (Gadzella, 1994). The number of original items on the Student-Life Stress Inventory (SLSI) scale was 57 items, which were modified by reducing the number of items to 37 to suit the research subjects. The modified scale had been tested for reliability and Cronbach's Alpha showed the reliability of academic stress items as 0.989. In this questionnaire, participants were asked to rate the extent to which the statements describe themselves, ranging from a score of 1 ("very inappropriate") to 4 ("very appropriate"). The total scores of the participants ranged from 37 to 148.

Self-Regulated Learning was measured using the Assessing Academic Self-Regulated Learning scale by Wolters et al. (2005). This scale is used to measure the level of self-regulation in students' learning in three aspects: metacognition, motivation, and behavior. The number of original items in the Assessing Academic Self-Regulated Learning scale was 97 items, which were modified by reducing the number of items to 40 to suit the research subjects. The modified scale had been tested for reliability, and Cronbach's Alpha showed the reliability of the self-regulated learning items as 0.988. In this questionnaire, participants were asked to rate the extent to which the statements described themselves, ranging from a score of 1 ("very inappropriate") to 4 ("very appropriate"). The total scores of the participants ranged from 40 to 148.

Student engagement was measured using the SESQ scale, which refers to the aspects of Hart et al. (2011). This scale is used to see the level of student engagement both inside and outside the classroom through three aspects: affective engagement (emotional engagement), behavioral engagement (behavioral engagement), and cognitive engagement (cognitive engagement). The number of original items on the SESQ scale was 33 items, which were modified by reducing the number of items to 30 to suit the research subjects. The modified scale had been tested for reliability, and Cronbach's Alpha showed the reliability of the student engagement items as 0.983. In this questionnaire, participants were asked to rate the extent to which the statements described themselves, starting from a score of 1 ("very inappropriate") to 4 ("very appropriate") for favorable items and vice versa for unfavorable items. The total scores of the participants ranged from 30 to 120.

Data Analysis

Data analysis was carried out using the Partial Least Squares (PLS) method through the SmartPLS 3.0 application. The Structural Equation Modeling (SEM) approach was applied to evaluate statistical models involving mediation effects, which examine the relationship between independent variables and dependent variables through mediating variables. In PLS-SEM, there are two measurement submodels: the measurement model (outer model) and the structural model (inner model).

The measurement model, or outer model, is used to conduct validity and reliability tests. The validity testing procedure is carried out by testing convergent validity and discriminant validity. Convergent validity testing refers to an outer loading value of more than 0.6 from the research construct indicators and an Average Variance Extracted (AVE) value of more than 0.5 (Ghozali & Latan, 2015). One of the evaluations for the outer model in PLS-SEM is the reliability test, which indicates that a variable has good reliability if Cronbach's alpha and composite reliability values are above 0.7 (Ghozali, 2021).

The structural model or inner model is used to predict or show the existence of causality (cause and effect relationship) between variables in the study by looking at the R-square, F-square, Q-square, T value, and significance coefficient value on the path coefficient. Assessment of the path coefficient, which aims to determine the direction of the relationship in the structural model or inner model, is obtained by bootstrapping, where the value is said to be significant if the T-statistic value is greater than 1.96 with a significance level of 5%.

RESULT AND DISCUSSION

Result Outer Model

Validity testing is carried out by testing convergent validity and discriminant validity. Convergent validity is tested based on the outer loading value, where indicators with values above 0.6 are considered valid, while indicators below 0.6 must be eliminated from the model (Ghozali & Latan, 2015). The results of the outer loading are presented in Figure 1 and Table 2.

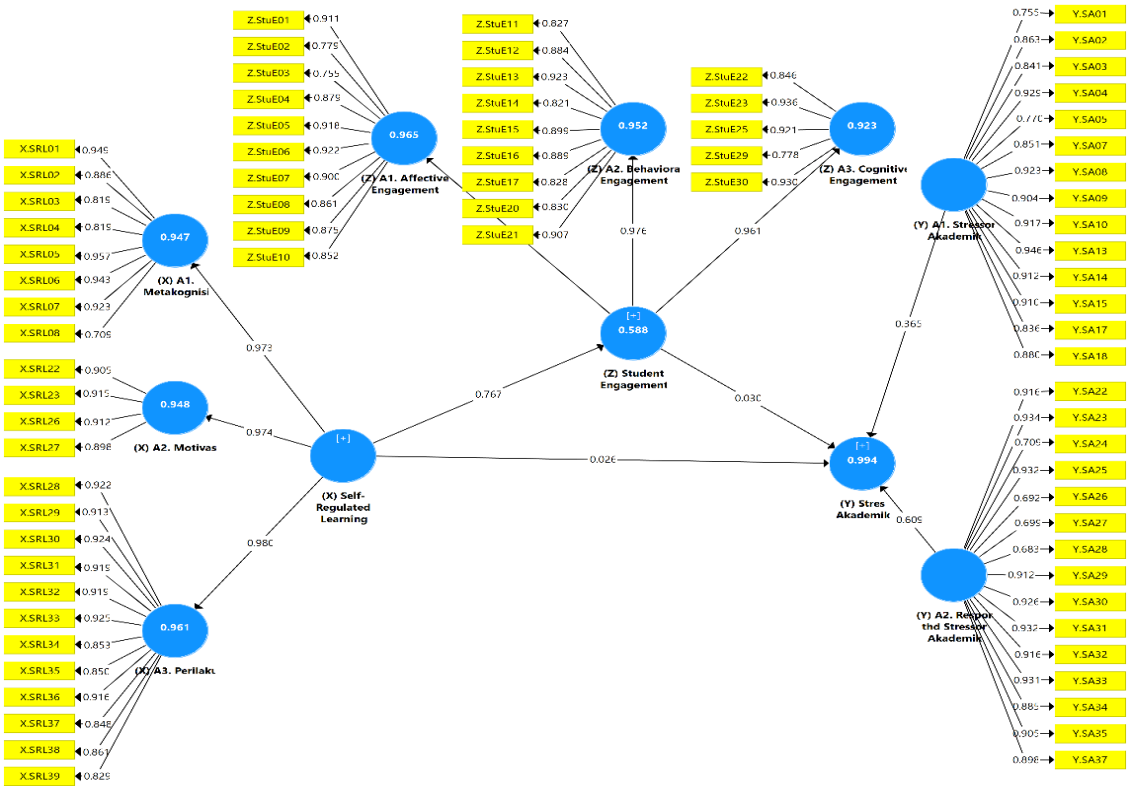

Figure 2. Outer Model: Loading factor after the indicators were eliminated

Table 2. Outer loading after the indicators were dropped

Variables	Dimensions	Indicators	Outer Loading
Self-regulated Learning	Metacognition	X.SRL01	0.920
		X.SRL02	0.865
		X.SRL03	0.845
		X.SRL04	0.788
		X.SRL05	0.910
		X.SRL06	0.898
		X.SRL07	0.891
		X.SRL08	0.708
	Motivation	X.SRL22	0.856
		X.SRL23	0.866
		X.SRL26	0.912
		X.SRL27	0.898
	Behavior	X.SRL28	0.905
		X.SRL29	0.895
		X.SRL30	0.907
		X.SRL31	0.891
		X.SRL32	0.902
		X.SRL33	0.902
		X.SRL34	0.837
		X.SRL35	0.826
		X.SRL36	0.916
		X.SRL37	0.834
		X.SRL38	0.833
		X.SRL39	0.818
Academic Stress	Academic Stressors	Y.SA01	0.717
		Y.SA02	0.798
		Y.SA03	0.774
		Y.SA04	0.924
		Y.SA05	0.804
		Y.SA07	0.785
		Y.SA08	0.915
		Y.SA09	0.882
		Y.SA10	0.903
		Y.SA13	0.949
		Y.SA14	0.902
		Y.SA15	0.885
		Y.SA17	0.751
		Y.SA18	0.885
	Reactions against Academic Stressors	Y.SA22	0.912
		Y.SA23	0.922
		Y.SA24	0.690
		Y.SA25	0.920
		Y.SA26	0.679
		Y.SA27	0.685
		Y.SA28	0.671
		Y.SA29	0.902
		Y.SA30	0.914
		Y.SA31	0.917
		Y.SA32	0.905

Variables	Dimensions	Indicators	Outer Loading
		Y.SA33	0.916
		Y.SA34	0.889
		Y.SA35	0.904
		Y.SA37	0.889
Student Engagement	Affective Engagement	Z.StuE01	0.869
		Z.StuE02	0.823
		Z.StuE03	0.814
		Z.StuE04	0.866
		Z.StuE05	0.884
		Z.StuE06	0.886
		Z.StuE07	0.855
		Z.StuE08	0.833
		Z.StuE09	0.845
		Z.StuE10	0.832
	Behavioral Engagement	Z.StuE11	0.872
		Z.StuE12	0.827
		Z.StuE13	0.861
		Z.StuE14	0.865
		Z.StuE15	0.846
		Z.StuE16	0.834
		Z.StuE17	0.860
		Z.StuE20	0.793
		Z.StuE21	0.853
	Cognitive Engagement	Z.StuE22	0.849
		Z.StuE23	0.869
		Z.StuE25	0.826
		Z.StuE29	0.812
		Z.StuE30	0.883

Table 2 shows the items that remain, while the self-regulated learning indicators (X.SRL09, X.SRL10, X.SRL11, X.SRL12, X.SRL13, X.SRL14, X.SRL15, X.SRL16, X.SRL17, X.SRL18, X.SRL19, X.SRL20, X.SRL21, X.SRL24, X.SRL25, and X.SRL40), academic stress indicators (Y.SA06, Y.SA11, Y.SA12, Y.SA16, Y.SA19, Y.SA20, Y.SA21, and Y.SA36), and student engagement indicators (Z.StuE18, Z.StuE19, Z.StuE24, Z.StuE26, Z.StuE27, and Z.StuE28) must be removed because they have an outer loading value below 0.6.

Furthermore, the results of construct validity and reliability presented in Table 3 show that the variables are considered reliable if Cronbach's alpha and composite reliability values are both more than 0.70 (Ghozali, 2021). Table 3 shows that all dimensions have AVE values above 0.5, so they meet the requirements and are the right measuring instruments to measure their variables. Table 3 also shows the Cronbach's alpha value and the composite reliability value, both exceeding 0.70, which means that the construct reliability is acceptable, thus indicating that the measuring instrument used in the study is reliable and can be used as a research measuring instrument.

Table 3. Outer Model: Construct Validity and Reliability

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
(X) A1. Metacognition	0.962	0.964	0.969	0.819
(X) A2. Motivation	0.929	0.929	0.949	0.823
(X) A3. Behavior	0.976	0.977	0.979	0.793
(X) Self-Regulated Learning	0.980	0.987	0.982	0.586
(Y) A1. Academic Stressors	0.976	0.979	0.979	0.767
(Y) A2. Responses toward Academic Stressors	0.986	0.986	0.987	0.875
(Y) Academic Stress	0.984	0.989	0.985	0.650
(Z) A1. Affective Engagement	0.963	0.963	0.968	0.751
(Z) A2. Behavioral Engagement	0.959	0.959	0.965	0.754
(Z) A3. Cognitive Engagement	0.929	0.930	0.947	0.782
(Z) Student Engagement	0.978	0.982	0.980	0.632

The next step is to test the discriminant validity to ensure that each concept of each latent model is different from the other variables. Discriminant validity is assessed by observing the cross-loading value on each construct with a measurement indicator that is greater than those of other constructs (Ghozali & Latan, 2015). The results can be seen in Table 4.

Table 4. Outer Model: Cross Loading

	(X) A1	(X) A2	(X) A3	(X) SRL	(Y) A1	(Y) A2	(Y) AS	(Z) A1	(Z) A2	(Z) A3	(Z) SE
X.SRL01	0.953	0.899	0.925	0.919	0.677	0.689	0.702	0.654	0.757	0.624	0.725
X.SRL02	0.888	0.861	0.886	0.864	0.580	0.601	0.632	0.677	0.748	0.672	0.726
X.SRL03	0.814	0.872	0.868	0.844	0.500	0.481	0.530	0.677	0.680	0.674	0.693
X.SRL04	0.826	0.730	0.753	0.788	0.687	0.734	0.718	0.515	0.608	0.491	0.592
X.SRL05	0.964	0.881	0.910	0.909	0.655	0.692	0.697	0.638	0.735	0.627	0.707
X.SRL06	0.947	0.866	0.893	0.898	0.631	0.670	0.667	0.643	0.728	0.618	0.706
X.SRL07	0.930	0.862	0.890	0.891	0.655	0.695	0.698	0.552	0.668	0.564	0.632
X.SRL08	0.642	0.666	0.687	0.707	0.395	0.390	0.434	0.689	0.634	0.686	0.676
X.SRL22	0.804	0.905	0.867	0.856	0.545	0.518	0.569	0.728	0.703	0.707	0.734
X.SRL23	0.813	0.915	0.878	0.865	0.557	0.528	0.582	0.713	0.699	0.709	0.726
X.SRL26	0.911	0.912	0.928	0.911	0.646	0.674	0.674	0.601	0.662	0.578	0.657
X.SRL27	0.893	0.898	0.915	0.898	0.665	0.697	0.702	0.564	0.643	0.574	0.632
X.SRL28	0.900	0.901	0.922	0.905	0.651	0.685	0.687	0.610	0.669	0.588	0.665
X.SRL29	0.898	0.880	0.913	0.895	0.634	0.654	0.659	0.596	0.672	0.568	0.655
X.SRL30	0.904	0.902	0.924	0.906	0.651	0.684	0.686	0.580	0.646	0.574	0.639
X.SRL31	0.900	0.883	0.919	0.889	0.622	0.654	0.658	0.553	0.630	0.562	0.618
X.SRL32	0.900	0.905	0.919	0.901	0.642	0.668	0.670	0.611	0.658	0.584	0.661
X.SRL33	0.903	0.907	0.925	0.901	0.640	0.677	0.678	0.586	0.650	0.584	0.646
X.SRL34	0.796	0.885	0.853	0.836	0.561	0.523	0.584	0.685	0.686	0.698	0.705
X.SRL35	0.798	0.852	0.849	0.825	0.485	0.473	0.517	0.663	0.674	0.657	0.682
X.SRL36	0.953	0.880	0.916	0.915	0.667	0.697	0.710	0.650	0.745	0.633	0.719
X.SRL37	0.796	0.865	0.848	0.834	0.521	0.491	0.543	0.714	0.704	0.685	0.722
X.SRL38	0.801	0.867	0.861	0.831	0.500	0.485	0.535	0.669	0.670	0.680	0.687
X.SRL39	0.786	0.846	0.829	0.817	0.475	0.449	0.492	0.689	0.676	0.647	0.691
Y.SA01	0.430	0.440	0.414	0.460	0.755	0.652	0.718	0.343	0.380	0.345	0.396
Y.SA02	0.454	0.445	0.426	0.466	0.863	0.728	0.800	0.376	0.412	0.387	0.437
Y.SA03	0.444	0.440	0.421	0.453	0.841	0.711	0.776	0.372	0.402	0.392	0.432

	(X) A1	(X) A2	(X) A3	(X) SRL	(Y) A1	(Y) A2	(Y) AS	(Z) A1	(Z) A2	(Z) A3	(Z) SE
Y.SA04	0.665	0.619	0.629	0.635	0.929	0.943	0.928	0.476	0.585	0.492	0.577
Y.SA05	0.823	0.776	0.791	0.783	0.770	0.778	0.805	0.678	0.784	0.684	0.753
Y.SA07	0.457	0.463	0.441	0.485	0.851	0.710	0.788	0.412	0.423	0.386	0.456
Y.SA08	0.673	0.629	0.638	0.639	0.923	0.942	0.919	0.528	0.621	0.509	0.621
Y.SA09	0.657	0.615	0.626	0.623	0.904	0.914	0.888	0.523	0.604	0.511	0.614
Y.SA10	0.652	0.636	0.631	0.638	0.917	0.907	0.907	0.529	0.579	0.492	0.596
Y.SA13	0.706	0.660	0.661	0.682	0.946	0.954	0.951	0.489	0.583	0.482	0.582
Y.SA14	0.687	0.651	0.649	0.660	0.912	0.915	0.906	0.479	0.572	0.505	0.580
Y.SA15	0.653	0.641	0.636	0.647	0.910	0.881	0.889	0.470	0.538	0.436	0.546
Y.SA17	0.430	0.462	0.446	0.474	0.836	0.679	0.755	0.366	0.375	0.354	0.415
Y.SA18	0.673	0.631	0.639	0.655	0.880	0.890	0.887	0.466	0.528	0.471	0.546
Y.SA22	0.649	0.590	0.592	0.604	0.897	0.927	0.915	0.486	0.580	0.501	0.579
Y.SA23	0.703	0.641	0.650	0.674	0.893	0.937	0.923	0.490	0.587	0.521	0.589
Y.SA24	0.463	0.439	0.436	0.503	0.543	0.564	0.676	0.399	0.453	0.471	0.463
Y.SA25	0.695	0.648	0.650	0.671	0.897	0.952	0.923	0.511	0.597	0.513	0.604
Y.SA26	0.455	0.455	0.446	0.507	0.541	0.545	0.665	0.369	0.403	0.428	0.423
Y.SA27	0.435	0.422	0.420	0.483	0.547	0.550	0.671	0.364	0.413	0.421	0.422
Y.SA28	0.418	0.414	0.406	0.460	0.537	0.533	0.657	0.344	0.394	0.416	0.402
Y.SA29	0.655	0.613	0.616	0.630	0.893	0.943	0.906	0.493	0.560	0.496	0.579
Y.SA30	0.679	0.611	0.622	0.642	0.887	0.939	0.916	0.495	0.581	0.487	0.580
Y.SA31	0.659	0.607	0.614	0.632	0.894	0.936	0.919	0.451	0.531	0.472	0.539
Y.SA32	0.687	0.650	0.650	0.672	0.888	0.943	0.908	0.501	0.565	0.496	0.583
Y.SA33	0.671	0.604	0.616	0.638	0.885	0.942	0.917	0.488	0.587	0.477	0.578
Y.SA34	0.679	0.631	0.627	0.645	0.890	0.918	0.894	0.525	0.615	0.540	0.625
Y.SA35	0.668	0.638	0.635	0.641	0.907	0.932	0.908	0.495	0.594	0.492	0.593
Y.SA37	0.668	0.644	0.645	0.650	0.885	0.922	0.893	0.526	0.613	0.513	0.617
Z.StuE01	0.527	0.556	0.558	0.579	0.410	0.408	0.447	0.910	0.793	0.871	0.864
Z.StuE02	0.775	0.744	0.740	0.751	0.704	0.727	0.740	0.780	0.841	0.717	0.828
Z.StuE03	0.681	0.616	0.643	0.636	0.468	0.505	0.521	0.756	0.879	0.736	0.817
Z.StuE04	0.616	0.668	0.648	0.631	0.467	0.461	0.495	0.879	0.835	0.829	0.866
Z.StuE05	0.538	0.576	0.571	0.592	0.430	0.425	0.468	0.918	0.803	0.908	0.878
Z.StuE06	0.546	0.580	0.579	0.605	0.438	0.441	0.481	0.921	0.810	0.896	0.880
Z.StuE07	0.518	0.561	0.553	0.578	0.407	0.388	0.433	0.899	0.776	0.855	0.849
Z.StuE08	0.626	0.700	0.674	0.658	0.448	0.449	0.482	0.861	0.794	0.786	0.833
Z.StuE09	0.612	0.657	0.647	0.621	0.426	0.393	0.440	0.875	0.812	0.790	0.844
Z.StuE10	0.536	0.550	0.536	0.577	0.431	0.405	0.454	0.851	0.783	0.836	0.827
Z.StuE11	0.574	0.566	0.559	0.603	0.437	0.432	0.476	0.891	0.826	0.872	0.867
Z.StuE12	0.784	0.697	0.723	0.730	0.662	0.671	0.685	0.757	0.885	0.720	0.833
Z.StuE13	0.720	0.684	0.697	0.689	0.540	0.565	0.588	0.805	0.923	0.766	0.865
Z.StuE14	0.582	0.576	0.570	0.613	0.447	0.457	0.496	0.879	0.820	0.871	0.860
Z.StuE15	0.692	0.666	0.687	0.669	0.523	0.538	0.559	0.804	0.900	0.740	0.850
Z.StuE16	0.716	0.690	0.707	0.700	0.520	0.551	0.569	0.780	0.889	0.747	0.838
Z.StuE17	0.566	0.541	0.544	0.587	0.436	0.420	0.468	0.868	0.826	0.866	0.855
Z.StuE20	0.754	0.736	0.741	0.731	0.666	0.695	0.697	0.736	0.831	0.700	0.799
Z.StuE21	0.706	0.673	0.680	0.673	0.527	0.550	0.575	0.796	0.908	0.780	0.857
Z.StuE22	0.629	0.685	0.664	0.647	0.504	0.502	0.542	0.857	0.796	0.846	0.849
Z.StuE23	0.557	0.591	0.579	0.611	0.446	0.442	0.486	0.873	0.793	0.936	0.863
Z.StuE25	0.514	0.578	0.566	0.583	0.411	0.408	0.448	0.826	0.738	0.920	0.821
Z.StuE29	0.731	0.669	0.686	0.681	0.545	0.599	0.624	0.742	0.860	0.779	0.815
Z.StuE30	0.555	0.595	0.581	0.613	0.431	0.418	0.464	0.894	0.812	0.929	0.878

Based on Table 4, discriminant validity shows that the loading factor value for each latent variable and its indicators has a higher loading value compared to the loading value of other latent variables. Therefore, each latent variable meets the requirements for discriminant validity (Ghozali, 2021). In addition to paying attention to the cross-loading value, discriminant validity can be seen from the Heterotrait-Monotrait (HTMT) value. If the HTMT value is less than 0.90, then it has good discriminant validity (Ghozali, 2021). The results are presented in Table 5. Table 5 shows that the HTMT value for each variable is less than 0.90, so it can be concluded that the construct model can meet discriminant validity.

Table 5. Heterotraid-Monotraid (HTMT)

	(X) Self-Regulated Learning	(Y) Academic Stress	(Z) Student Engagement
(X) Self-Regulated Learning			
(Y) Academic Stress	0,741		
(Z) Student Engagement	0,780	0,685	

Result Inner Model

The second stage of SmartPLS analysis is the structural model test or inner model, which is carried out to predict or show the existence of a causal relationship (cause-and-effect relationship) between construct variables in the study. Figure 3 below shows the second stage of SmartPLS analysis, namely bootstrapping to see R-Square and F-Square.

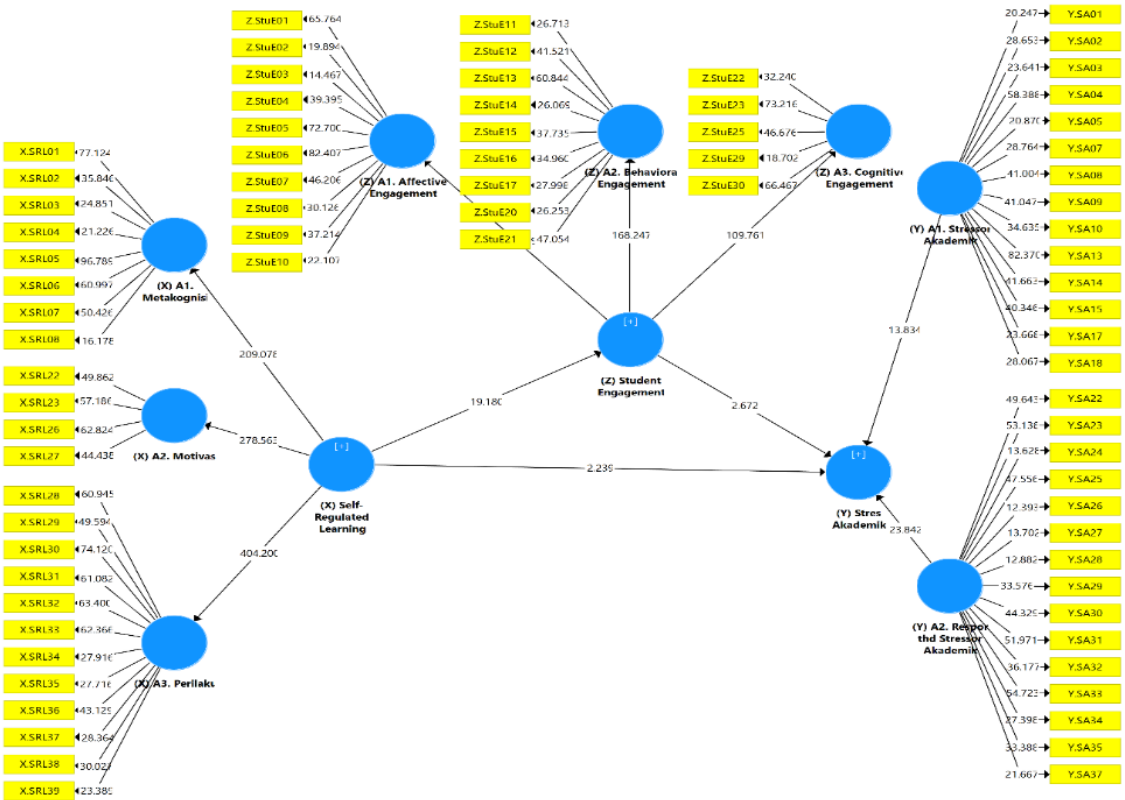

Figure 3. Inner Model: Bootstrapping

The coefficient of determination, or R-squared, is a way to assess how much the independent variable affects the dependent variable, with the expected R-squared value between 0 and 1. R-squared values of 0.75, 0.50, and 0.25 indicate that the model is strong, moderate, and weak (Sarstedt et al., 2020). The results are presented in Table 6.

Table 6. Inner Model: R-square

	R Square	R Square Adjusted
(Y) Academic Stress	0.994	0.994
(Z) Student Engagement	0.588	0.585

Table 6 R-square results show the effect of self-regulated learning (X) on student engagement (Z) of 0.588, with an adjusted R-square value of 0.585. It can be interpreted that self-regulated learning has a contribution to student engagement of 58.8%. In addition, Table 7 also shows the results of the R-square calculation of the effect of self-regulated learning (X) and student engagement (Z) together on academic stress (Y), showing a value of 0.994, which can be interpreted as self-regulated learning and student engagement together affecting academic stress by 99.4%.

The next test is to determine the effect size value or the magnitude of the influence between variables by considering the F-square. The assessment for effect size is divided into three categories, namely 0.02, 0.15, and 0.35, which interprets that the latent variable predictor has a weak, moderate, and strong influence (Ghozali, 2021). The results of the analysis are presented in Table 7.

Table 7. Inner Model: F-Square

	(X) Self-Regulated Learning	**(Y) Academic Stress**	**(Z) Student Engagement**
(X) Self-Regulated Learning		0.040	1.428
(Y) Academic Stress			
(Z) Student Engagement		0.063	

Table 7 shows the F-square value of each variable, which concludes that self-regulated learning has a greater influence on student engagement than the influence of self-regulated learning on academic stress and student engagement on academic stress.

Result Path Analysis

The next stage was to test the hypothesis to see the direct influence by measuring the estimate for the path coefficient and paying attention to the P-values to determine whether or not there is an influence on each component. The hypothesis can be accepted if the P-values for each hypothesis are less than 0.05 (Ghozali, 2021). In addition, with the specific indirect effect measurement test, it can be seen whether the mediating variable acts as a perfect mediator or a partial

mediator. The direct and indirect effect hypothesis test is presented in Table 8 below.

Table 8. Direct-Indirect Effect Path Analysis for Hypothesis-Testing

	Original Sample	Sample Mean (M)	Standard Deviation	T statistics	P Values
(X) Self-Regulated Learning -> (Y) Academic Stress	0,026	0.025	0.012	2,239	0,026
(X) Self-Regulated Learning -> (Z) Student Engagement	0,767	0.764	0.040	19,180	0,000
(Z) Student Engagement -> (Y) Academic Stress	0,030	0.030	0.011	2,672	0,008
(X) Self-Regulated Learning -> (Z) Student Engagement -> (Y) Academic Stress	0.023	0.023	0.009	2.617	0.009

Table 8 presents the results of the path coefficient, which show that all relationships between variables are statistically significant. Self-regulated learning has a direct and significant effect on academic stress, with a P-value of 0.026 (<0.05) and a T-statistics value of 2.239 (>1.96). Furthermore, self-regulated learning has a direct and significant effect on student engagement, with a P-value of 0.000 (<0.05) and a T-statistics value of 19.180 (>1.96). Then, student engagement has a direct and significant effect on academic stress, with a P-value of 0.008 (<0.05) and a T-statistics value of 2.672 (>1.96). In addition, the results of the hypothesis test show that self-regulated learning has an indirect and significant effect on academic stress through student engagement as a mediator, with a P-value of 0.009 (<0.05) and a T-statistics value of 2.617 (>1.96). From Table 8, it can be concluded that the mediation analysis shows that if the mediator variable explains part of the relationship between the independent and dependent variables, but there is still a direct effect that the mediator does not fully explain, then this is called partial mediation (Baron & Kenny, 1986).

The hypothesis of this study is the influence of self-regulated learning on academic stress through the mediator of student engagement in Islamic schools in Banyumas. Based on the results of the study, self-regulated learning has a significant direct effect on academic stress, and there is also a significant indirect effect of self-regulated learning on academic stress through student engagement as a mediator. Therefore, hypothesis four in this study is empirically proven.

The results of the path analysis showed that the direct effect of self-regulated learning on academic stress was significant, which is consistent with previous studies stating that academic stress is partly caused by low self-regulated learning (Hamim & Rahmawati, 2022). Various demands and pressures can cause academic stress: physical, such as psychosomatic symptoms; cognitive, such as perceptions of heavy tasks; affective, such as feelings of pressure from parents; and cognitive, such as perceptions of heavy tasks (Novianti & Mariyati, 2023). In addition, the pressures that occur on students are caused by competition and academic demands (Barseli et al., 2017).

Research conducted by Tomas and Poroto (2023) stated that self-regulated learning has a significant impact on learning flow, academic stress, and learning engagement. This shows that self-regulated learning is an important foundation. Self-Determination Theory (SDT) is a motivational framework that emphasizes basic psychological needs that drive individuals to develop and function optimally. SDT helps to understand how these needs affect the self-regulated learning process (Brenner, 2022). Good self-regulated learning will help someone meet various demands and play a role in regulating emotions so that students do not consider learning or assignments as stressful because when students can control stress, learning with any method will be maximized (Nufus et al., 2024).

Self-regulated learning is usually used in high school students and above compared to elementary and junior high school students because self-regulated learning requires motivation and reflection skills, so junior high school students are considered less able to reflect on something than high school students (J. Li et al., 2018; Panadero, 2017). However, self-regulated learning can still be used for junior high school students by making it easier to understand so that it can be accepted by students (Wahidah & Kurniawati, 2020). Students need to have independent learning management so that they can regulate their own learning methods. Students can adjust their learning methods according to their abilities, including managing time well so that there is a low potential for experiencing academic stress (Candra & Rani, 2022).

In addition, the results of this study show a significant direct effect of self-regulated learning on student engagement. The results of this study are supported by previous research by Liao et al. (2023), which states that aspects of self-regulated learning influence student engagement. Self-regulated learning has a significant contribution to student engagement. If students have poor self-regulation in learning, it will have an impact on procrastination and neglect of tasks, and it can have a negative impact on individual psychological conditions such as low self-confidence, depression, and stress (Wahyuni, 2022). Besides that, Estévez et al. (2021) also stated that students who are skilled in independent learning, such as planning, monitoring, and adjusting learning strategies, show a higher level of engagement (Kibtiyah & Suud, 2024). Students who regulate their own learning tend to be more involved in the learning process because they feel they have ownership of their learning (Wibowo, 2016).

The results of this study indicate that student engagement also has a significant effect on academic stress. This is in line with the research of Novianti and Mariyati (2023), which found a significant effect on both variables. Students who are involved in the evaluation experience fewer negative impacts from psychological stress. With this involvement, students have more control over their learning process, which can help reduce stress, anxiety, or feelings of pressure because they feel more prepared and aware of the progress and challenges they face (Marlin et al., 2020). In this way, teachers can recognize different styles of involvement or student engagement among students. In

addition, teachers can encourage their students to be more active in class because students who are actively involved experience less stress due to better learning outcomes (Schnitzler et al., 2021).

The results of this study also show an indirect effect that causes student engagement to act as a partial mediator between self-regulated learning and academic stress. In this way, self-regulated learning can increase student engagement, reduce academic stress, or direct academic stress to positive stress in students. This is because self-regulated learning will encourage students to have independent learning arrangements that will encourage them to be more active and involved in learning. This activity can help students direct academic pressure into positive stress or eustress. Eustress (good stress) is beneficial stress or stress that can foster stimulus and excitement and increase creativity and enthusiasm (C. Li et al., 2016).

From an Islamic perspective, patience and dependence on Allah are the keys to overcoming problems (Alfain et al., 2023), as written in the Qur'an, Surah Al-Baqarah, verse 152, that it is important to remember Allah (dhikrullah) in everyday life, including when facing difficulties. In self-regulated learning, self-reflection is an important part of the learning process. By reflecting on the progress and challenges faced, students can evaluate how they learn.

Self-regulated learning can reduce academic stress through student involvement in the learning process. This is because students who have the skills to regulate learning independently tend to be more actively involved in learning. Students become more proactive in seeking information, managing study time, and completing assignments (Sutikno, 2016). Then, if students are actively involved, they will feel more competent and confident in facing academic tasks, which can reduce feelings of anxiety and stress that often arise when students feel incapable or unprepared for various demands (Rudiansyah et al., 2016). Thus, student involvement becomes important as an intermediary because involvement emphasizes how students learn, not only the results they achieve but also with a focus on the process, so that students can develop more sustainable skills (Munawarah et al., 2024). Involvement also makes the learning experience more enjoyable, so students are more motivated to continue learning. Through involvement, students build their self-identity as active and high-achieving learners (Dharmayana & Shinta, 2019). Student involvement in the learning process is an important factor underlying student success. In addition, enjoyable learning experiences resulting from learning engagement contribute to increased academic achievement and the formation of students' positive emotions.

CONCLUSIONS

The results of this study empirically prove that student engagement mediates the influence of self-regulated learning on students' academic stress in Islamic schools. In addition, increasing SRL will also increase student engagement in learning, which will lead to a reduction in academic stress or turn the stress

experienced by students into positive stress that will increase students' motivation to learn. That way, schools can teach students to independently regulate their learning styles and also improve the quality of learning by paying attention to student engagement, thereby reducing academic stress in students.

The implications of these findings can be applied through an approach that strengthens student engagement in the learning process, which in turn helps students manage academic stress more positively. Mentoring programs by teachers that integrate Islamic values can help students regulate their learning process. Through this guidance, students learn about self-management and how to overcome academic stress with an Islamic approach, such as patience, tawakkal, and ikhtiar.

However, this study has limitations because it does not specifically explore how each category of self-regulated learning contributes to student engagement and academic stress. The researchers also did not consider differences in demographic characteristics, such as gender and age, so future researchers could adopt a broader approach.

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