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The role of self-regulation as an intervening variable in the influence of self-efficacy on the learning outcomes of Islamic religious education

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Abstract: Low learning outcomes were observed among some high school students. Psychologically, this issue is influenced by self-efficacy and self-regulation, which students also lack. Therefore, this research aims to examine the influence of self-efficacy on learning outcomes with self-regulation as an intervening variable. This research involved 600 students from elite public high schools in Sinjai, South Sulawesi, Indonesia. School selection was carried out by random sampling across Sinjai. Data were collected through self-efficacy and self-regulation questionnaires as well as learning outcome assessments. Data were analyzed using descriptive statistics and SEM methods. The research results show that self-efficacy does not have a significant effect on learning outcomes (p-value=0.761), but self-efficacy has a significant effect on self-regulation (p-value=0.000). Meanwhile, self-regulation has a significant direct effect on learning outcomes (p-value=0.005). Self-efficacy significantly affects learning outcomes with self-regulation as an intervening variable (p-value=0.017). The goodness of fit indicators are R^2 and SRMR. R^2 for learning outcomes and self-regulation are 0.68 and 0.27, respectively, and the model's SRMR score is 0.09. This research emphasizes the importance of self-regulation and self-efficacy in improving learning outcomes.

Keywords: *Islamic religious education, Learning outcomes, Self-efficacy, Self-regulation.*

1. Introduction

1.1. Background of the Study

Islamic Religious Education (PAI) is a compulsory subject at all levels of education in Indonesia, from elementary to high school. However, the limited time allocation of only 2 hours per week leads to low PAI learning outcomes, with only 30% of students meeting the set qualifications (based on interviews and documentation at school).

Several factors, including adaptation to higher levels of education and low student self-efficacy, can cause these low PAI learning outcomes. Many students feel shy to ask questions or express opinions, indicating a lack of confidence. In addition, the lack of self-regulation skills in learning also harms learning outcomes. Self-efficacy and self-regulation are important in student learning success (Rorimpandey & Midun, 2021)

Previous research shows that self-efficacy significantly influences learning outcomes (Rorimpandey & Midun, 2021) and self-regulation (Panadero, 2017; Ro & Loya, 2015) . Recent studies also support these findings, such as research by Hoffman & Hatch (1996) , which found a positive correlation between self-efficacy and academic achievement in the context of transformational leadership, as well as research by Fan & Cui (2024) , which showed that students' interaction with generative artificial intelligence strengthened self-efficacy and cognitive engagement which improved learning outcomes. However,

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research examining the effect of self-efficacy on PAI learning outcomes through self-regulation has not been conducted.

This study aims to investigate and analyze the impact of self-efficacy on PAI learning outcomes, the impact of self-efficacy on self-regulation, and the impact of self-regulation on PAI learning outcomes. In addition, this study also examines the effect of self-efficacy on PAI learning outcomes through self. The basic assumption of this study is that students' belief in their ability (self-efficacy) and their ability to self-regulate (self-regulation) play an important role in improving PAI learning outcomes. This study offers novelty by examining the role of self-regulation as an intervening variable and considering its implications in the context of PAI learning.

2. Literature Review

2.1. Self-Efficacy

2.1.1. Definition of Self-Efficacy

Albert Bandura is the figure who introduced the term self-efficacy. Bandura defines self-efficacy as an individual's belief about his or her ability to perform tasks or actions needed to achieve certain results. Etymologically, "self-efficacy" consists of two words, namely "self" which means an element of the personality structure, and "efficacy" which means self-assessment of the ability to perform actions following requirements. Self-efficacy provides the basis for motivation, well-being, and personal achievement because individuals believe their actions can achieve the desired results despite difficulties. Bandura emphasizes that self-efficacy is an important factor that influences how individuals think, feel, motivate themselves, and behave (Kim, 2021; Kurtovic et al., 2019; Tonga et al., 2020) .

2.1.2. Aspects of Self-Efficacy

According to Bandura, self-efficacy in individuals differs from one another based on three aspects:

Level: The level of self-efficacy is associated with the difficulty of the task the individual feels capable of performing. The level of self-efficacy influences the behavior that the individual feels capable of performing and avoids behavior beyond the limits of perceived ability. Individuals with high self-efficacy at a given level of task difficulty tend to be more courageous and more persistent in their efforts (Schunk & DiBenedetto, 2020) .

Strength: The strength aspect relates to the degree of strength of an individual's beliefs about his or her abilities. Unsupportive experiences easily shake weak expectations, whereas strong expectations encourage individuals to persist in their efforts. Individuals with strong self-efficacy tend to be more resistant to failure and more persistent in achieving their goals (Ismayilova & Klassen, 2019; Klassen & Tze, 2014) .

Generalization (Generality): The aspect of generalization relates to the breadth of behavioral areas where individuals feel confident about their abilities. This includes confidence in one's abilities in various activities and situations. Individuals with high self-efficacy in various situations show greater flexibility and adaptability in facing challenges (Akhsania & Japar, 2020; Luszczynska et al., 2005) .

Self-efficacy plays an important role in various aspects of life, including in the context of education. Research shows that students' self-efficacy is positively related to learning motivation, self-regulation strategies and academic achievement. Students with high self-efficacy tend to be more proactive in their learning, better able to overcome obstacles and achieve better learning outcomes (Honicke, Toni; Broadbent, 2016; Honicke & Broadbent, 2016) .

2.2. Self-Regulation

2.1.1. Definition of Self-Regulation

Etymologically, self-regulation comes from English, namely "self" which means "self" and "regulation" which means "arrangement". According to the definition, self-regulation is a person's ability to manage himself, feelings, behavior, and his learning environment, as well as conducting information searches to people who understand better or are involved in the learning process (Schunk &

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Zimmerman, 2011; Zimmerman & Kitsantas, 2014) . Self-regulation includes thoughts, feelings, and actions that are planned by oneself and adjusted cyclically with efforts to achieve personal goals. Putri & Prabawanto (2019) and Bandura (1977) also mentioned that self-regulation is the ability to control one's behavior, which is a prime mover in human personality. Self-regulation is closely related to self-concept and plays an important role in learning and academic performance.

2.2.2. Aspects of Self-Regulation

Self-regulation consists of several aspects that greatly support the learning process of students:

Personal Aspects: This aspect covers an individual's ability to manage and design learning goals. Learners not only know the strategies to use but also know the right time to use these strategies to be effective. Individuals who have good self-regulation can plan, organize, and evaluate their learning process effectively (Panadero, 2017; Schunk, 2011; Yosef, 2022) .

Behavioral Aspects: Self-observation is the first factor of the behavioral function in self-regulation. Self-observation is an attempt by learners to control the learning outcomes achieved. Self-judgment is the activity of comparing learning outcomes with goals to be achieved. Personal factors and self-observation also influence this evaluation process. In addition, self-reaction to learning outcomes is also part of self-regulation (Bukhori et al., 2022; Schunk et al., 2007; Schunk & Zimmerman, 2011) .

Environmental Aspects: A supportive learning environment is an important factor in self-regulation. Learning from observing others and from experience greatly influences the effort to understand the material being studied. Learners who have good self-regulation will create a learning environment that supports their learning process (Hadwin et al., 2011; Jansen et al., 2020) .

Based on this description, self-regulation is an ability that involves using specific strategies to achieve academic goals. Learners' cognitive regulation and persistence in doing tasks determine their academic achievement's success. Learners with self-regulation in learning will be able to direct themselves, make plans, organize material, instruct themselves, and effectively evaluate their learning process (Schunk, 2011; Schunk et al., 2007)

2.3. Learning Outcomes

2.3.1. Definition of Learning Outcomes

Learning outcomes refer to patterns of actions, values, understanding, attitudes, appreciation, and skills students achieve after the learning process. According to Fan & Cui (2024) , learning outcomes can be in the form of verbal information (ability to express knowledge in the form of language), intellectual skills (ability to present concepts and symbols), cognitive strategies (ability to channel and direct cognitive activities), motor skills (ability to perform a series of physical movements with coordination), and attitudes (ability to accept objects based on judgment). Learning outcomes are the effects of the interaction between learning and teaching actions, where the teacher ends the teaching action with an evaluation and students reach the peak of their learning process.

2.3.2. Factors that Influence Learning Outcomes

Factors that influence learning outcomes can be divided into internal and external factors. Internal factors come from within learners, while external factors come from the environment around learners.

2.3.2.1. Internal factors

Physical and Mental Maturity: Education will be well received if it is appropriate to one's physical and mental maturity level. Disorders in mental conditions such as anxiety, anxiety, depression, and stress can interfere with the learning process and learning outcomes of students (Kannangara et al., 2018; Ljubin-Golub et al., 2019; Zimmerman, 1989) .

Intelligence: Intelligence is the general capacity of a person to cope with the demands of new needs or problems. A high level of intelligence makes it easier for individuals to understand subject matter than low intelligence (Kutyla et al., 2021; Sternberg, 2017) .

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Knowledge and Skills: A person's knowledge and skills influence his or her daily attitudes and actions, including the level of proficiency in learning and the quality of results obtained (Learn, 2000; Schunk, 2011) .

Interest and Motivation: Interest is the attraction to something that can encourage a person to do certain activities, while motivation is the force that provides the impetus to learn. Interest and motivation are crucial to optimal learning outcomes (Schunk, 2011; Schunk et al., 2014) .

Personal Characteristics: Personal characteristics such as diligence, hard work, discipline, and resilience tend to favor the achievement of good learning outcomes. Conversely, lazy and undisciplined traits can hinder learning (Duckworth et al., 2007; Nisa et al., 2022) .

2.3.2.2. External Factors

Family: A harmonious family environment and support from parents play an important role in achieving learning outcomes. Family economic factors also affect the ability to provide adequate learning facilities and infrastructure (Alford & DeOrio, 2019; Eccles & Roeser, 2011) .

Educators: Educators who are professional and prioritize teaching quality have a significant effect on student learning outcomes. Educators who can motivate and provide constructive feedback will improve student learning outcomes (Hattie, 2008) .

Educational Facilities and Infrastructure: The availability of adequate facilities and infrastructure, such as comfortable classrooms, teaching aids, and complete teaching materials, supports an effective teaching and learning process (Uline & Tschannen-Moran, 2008) .

Neighborhood Environment: A conducive and supportive learning environment, such as a community that values education and provides good learning facilities, contributes to learning outcomes (Fan & Cui, 2024) .

By understanding the factors that influence learning outcomes, both internal and external, teachers and educators can develop more effective learning strategies to improve student learning outcomes.

2.4. Self-Efficacy on Learning Outcomes

Self-efficacy, or self-efficacy, is an individual's belief about his or her ability to achieve a certain goal or outcome. Albert Bandura, the developer of the concept of self-efficacy, explained that self-efficacy affects how one thinks, feels, motivates oneself, and behaves. Self-efficacy consists of three main aspects: strength, level, and generality.

2.4.1. Strength

The strength aspect refers to how strong one's belief in one's abilities is. Strong expectations in self-efficacy will make individuals more persistent and resistant to failure, while obstacles will easily shake weak expectations. Individuals with strong self-efficacy tend to be highly motivated and more optimistic about academic tasks (Rahman et al., 2021; Schunk & DiBenedetto, 2020) .

2.4.2. Levels

The level aspect relates to the difficulty of the task the individual feels capable of performing. A person with high self-efficacy at a certain level of difficulty tends to be more willing to take on challenges and more confident in completing the tasks given. The level of self-efficacy influences behavioral choices, where individuals will be more likely to choose activities they believe they can complete (Ismayilova & Klassen, 2019; Klassen & Tze, 2014) .

2.4.3. Generality

The generalization aspect refers to the breadth of behavioral areas where individuals feel confident about their abilities. This includes confidence in one's abilities in different activities and situations. Individuals with high self-efficacy in various situations show greater flexibility and adaptability in

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facing challenges, making it easier to achieve in various academic contexts (Luszczynska et al., 2005; Tonga et al., 2020) .

2.5. Purpose or Hypotheses of the study

Based on the description above, the following hypothesis can be formulated:

H_0: There is a significant effect of self-efficacy on PAI learning outcomes.

This hypothesis states that increased self-efficacy, including strength, level, and generalization, will positively affect learning outcomes. This is because individuals with high self-efficacy tend to be more motivated, persistent, and effective in managing their learning strategies, thus achieving better academic performance.

2.6. Self-Efficacy on Self-Regulation

2.6.1. Description of the Relationship between Self-Efficacy and Self-Regulation

Self-efficacy is an individual's belief about his or her ability to achieve certain outcomes. Self-regulation is an individual's ability to manage their thoughts, feelings, and behaviors to achieve goals. The relationship between self-efficacy and self-regulation is very close, where high self-efficacy can improve self-regulation.

2.6.2. Strength

The strength aspect of self-efficacy reflects how strong a person's belief in their abilities is. Individuals with high self-efficacy strength tend to have better self-regulation because they believe they can overcome challenges and stay motivated to achieve their goals. This strength of self-efficacy makes individuals more consistent in using effective self-regulation strategies (Rahman et al., 2021; Schunk & DiBenedetto, 2020) .

2.6.3. Levels

The level aspect relates to the range of tasks that individuals can perform. Self-efficacy at different levels of tasks allows individuals to organize and manage self-regulation strategies that match the complexity of the task. For example, students who are confident in difficult tasks are more likely to use more complex self-regulation techniques such as timing and self-monitoring (Schunk, 2011; Zimmerman & Kitsantas, 2014) .

2.6.4. Generality

The generalization aspect refers to beliefs about self-efficacy in various situations and contexts. Individuals with high generalizations of self-efficacy will be more flexible and adaptive in using self-regulation strategies in various learning situations. This means that their belief in their ability is not limited to one area but extends to various activities, thus improving their overall self-regulation ability (Bandura, 2005; Tsani et al., 2019; Usher & Pajares, 2008) .

Recent research has also shown that self-efficacy plays an important role in self-regulation. A study in 2024 found that self-efficacy significantly predicted self-regulation and psychological well-being among students (Fan & Cui, 2024). In addition, self-efficacy is a mediator in developing good self-regulation (Hodson, 2021) .

Based on the description above, the following hypothesis can be formulated:

H_0: There is a significant influence between self-efficacy on students' self-regulation.

This hypothesis states that increased self-efficacy, including strength, level, and generalization, will positively affect increased self-regulation. This is because individuals with high self-efficacy tend to be more confident, motivated, and effective in managing their self-regulation strategies to achieve academic and personal goals.

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2.7. Self-Regulation on Learning Outcomes

Self-regulation is an individual's ability to manage their thoughts, emotions, and behaviors to achieve set goals. In an educational context, self-regulation is important in helping students directly and motivating themselves to learn effectively. The academic literature has widely documented the relationship between self-regulation and learning outcomes, showing that good self-regulation contributes significantly to academic achievement.

2.7.1. Planning and Goal Setting

Self-regulation involves the ability to plan and set specific learning goals. Students with good self-regulation skills can set realistic short-term and long-term goals, which helps them stay focused and motivated in the learning process. Research shows that students who set clear learning goals tend to have better learning outcomes because they can effectively direct their efforts (Schunk & Zimmerman, 2011) .

2.7.2. Self-Monitoring and Control

An important aspect of self-regulation is the ability to monitor and control oneself during learning. Students who can monitor their learning progress tend to identify difficulties more quickly and make the necessary adjustments to achieve their goals. Self-control also allows students to manage distractions and stay focused on the task at hand (Panadero, 2017) .

2.7.3. Self-Evaluation

Self-evaluation is an important part of self-regulation that involves assessing learning performance and goal achievement. Students who regularly evaluate their progress can identify areas for improvement and design more effective learning strategies. Self-evaluation helps students understand their strengths and weaknesses, ultimately improving learning outcomes (Zientek et al., 2019) .

Based on the description above, the following hypothesis can be formulated:

H_0 : There is a significant influence between self-regulation and student learning outcomes.

This hypothesis states that increased self-regulation will positively affect improved learning outcomes. This is because individuals with good self-regulation tend to be better able to plan, direct, and evaluate their learning efforts, so they can achieve better academic performance.

2.8. Self-Efficacy on Learning Outcomes Through Self-Regulation

Self-efficacy is an individual's belief in their ability to complete tasks and achieve goals. Self-regulation is managing thoughts, emotions, and behaviors to achieve goals. The literature has widely discussed the relationship between self-efficacy and learning outcomes through self-regulation, suggesting that high self-efficacy influences positive learning outcomes through effective self-regulation.

High self-efficacy allows students to be more confident in organizing the learning process. Students with strong self-efficacy tend to set clear goals, monitor their progress, and adjust their learning strategies as needed. Strong self-efficacy also encourages using better self-regulation strategies, such as planning, timing, and self-evaluation, all of which contribute to better learning outcomes (Schunk & Zimmerman, 2011; Zimmerman & Kitsantas, 2014) .

Self-regulation helps students focus on tasks, overcome distractions, and manage academic stress. Students who can plan, direct, and evaluate their learning efforts tend to achieve higher learning outcomes. Self-regulation also allows students to set clear goals and strategies to achieve them, improving their academic performance (Panadero, 2017; Schunk, 2011) .

Recent research shows that self-efficacy mediates the relationship between self-regulation and learning outcomes. High self-efficacy improves self-regulation, which in turn improves learning outcomes. Studies show that self-regulation mediates the influence of self-efficacy on learning outcomes,

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meaning that increasing self-efficacy can improve learning outcomes through increased self-regulation (Fan & Cui, 2024; Usher & Pajares, 2008) .

Furthermore, research by Yokoyama (2019) and Damian et al. (2017) confirmed that self-efficacy contributes significantly to achieving learning outcomes by increasing student motivation and persistence. The study shows that high self-efficacy allows students to cope with challenging tasks better, improving their learning outcomes.

Based on the description above, the following hypothesis can be formulated:

H_0: There is a significant influence between self-efficacy and learning outcomes through students' self-regulation.

This hypothesis states that increased self-efficacy will positively affect improved learning outcomes mediated by self-regulation. That is, high self-efficacy increases self-regulation, improving learning outcomes.

3. Methods

3.1. Research Approach

This study uses a quantitative approach with a causality design. Ex-post facto research was chosen because the independent variables had occurred when the researcher started with the observation of bound variables. This design allows researchers to trace the relationship between self-efficacy, self-regulation, and learning outcomes of Islamic Religious Education (PAI). With this approach, researchers can identify causal factors that have occurred naturally in the population studied.

3.2. Research Participants

This study involved 600 students from 2 of Sinjai's leading schools. The selection of the 2 schools used simple random sampling from all superior high schools in Sinjai district, South Sulawesi.

3.3. Data Collection Instruments

The data collection instrument consists of two main parts: 1. Information; 2. Self-Efficacy Scale: This scale adopts a four-point Likert Scale with items ranging from "Disapprove" (1) to "Strongly Agree" (4). The scale includes three main aspects: Level: Measures students' confidence in coping with tasks with different levels of difficulty; Strength: Measure students' confidence in trying to achieve learning goals; Generality: Measure students' confidence in diverse social situations. 3. Self-Regulation Scale: This scale also uses a four-point Likert Scale with four main aspects: Personal: Measure students' ability to regulate and change their learning behavior; Learning Behavior: Measures students' persistence and effort in achieving academic goals; Learning Environment: Measures students' ability to manage their learning environment; Self-Evaluation: Measures students' ability to evaluate their learning processes and outcomes.

Each scale has been tested for validity and reliability to determine accuracy and consistency in measuring variables. .

3.4. Data Collection Procedure

The data collection procedure is carried out in several stages: Preparation: The researcher obtains permission from the school and explains the purpose of the research to the principal and teachers. Socialization was carried out to students about the importance of their participation in this research. Data Collection: Questionnaires are distributed directly to students. Each student is given enough time to fill out the questionnaire. Researchers provide assistance and clarification on-site, ensuring any questions are answered correctly. Learning Outcome Collection: PAI learning outcome data is taken from the results of the final school examination provided by the school. This value is used as an indicator of learning outcomes in this study.

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3.5. Data Analysis

The collected data is analyzed through several stages: Descriptive Statistics: The data is analyzed to describe the basic characteristics of the data obtained, such as the total number of samples, mean values, standard deviations, and value ranges. Descriptive statistics are used to provide an overview of the data collected. Next, SEM uses the SMART PLS program to test the relationship between variables in the conceptual model. This analysis allows testing the direct and indirect effects of self-efficacy, self-regulation, and learning outcomes. SEM is used to measure the relationship between variables, both indicators of latent variables and fellow latent variables.

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Descriptive Statistics

Descriptive analysis was carried out to find out the general picture of the data analyzed. The results of the descriptive analysis are shown in Table 1.

Table 1.
Description analysis.

Variable	N	Range	Mean	Standard deviation	Variance
Levels	600	1.6	3.27	0.31	0.096
Strength	600	1.8	3.21	0.38	0.15
Generality	600	2.1	3.28	0.46	0.21
Person	600	1.8	3.18	0.34	0.12
Academic behavioral	600	2.2	3.14	0.51	0.26
Learning environment	600	1.9	3.06	0.42	0.18
Learning outcomes	600	44	81.03	9.3	88.01
Valid	600				

4.1.2. First Order SEM Analysis

4.1.2.1. First order

Evaluation of the measurement model is carried out in first order for the dimension level. There are two aspects that will be measured to evaluate the measurement model, namely validity and reliability. The validity test is carried out by paying attention to the outer loading score and Average Variance Extracted (AVE). If the score is from both < 0.5 then the item is invalid and will be removed from the indicator. Reliability testing is carried out by paying attention to the Composite reliability score. If the score < 0.7 is then the item is not reliable in measuring. In the initial design of the measurement model, the following results were obtained.

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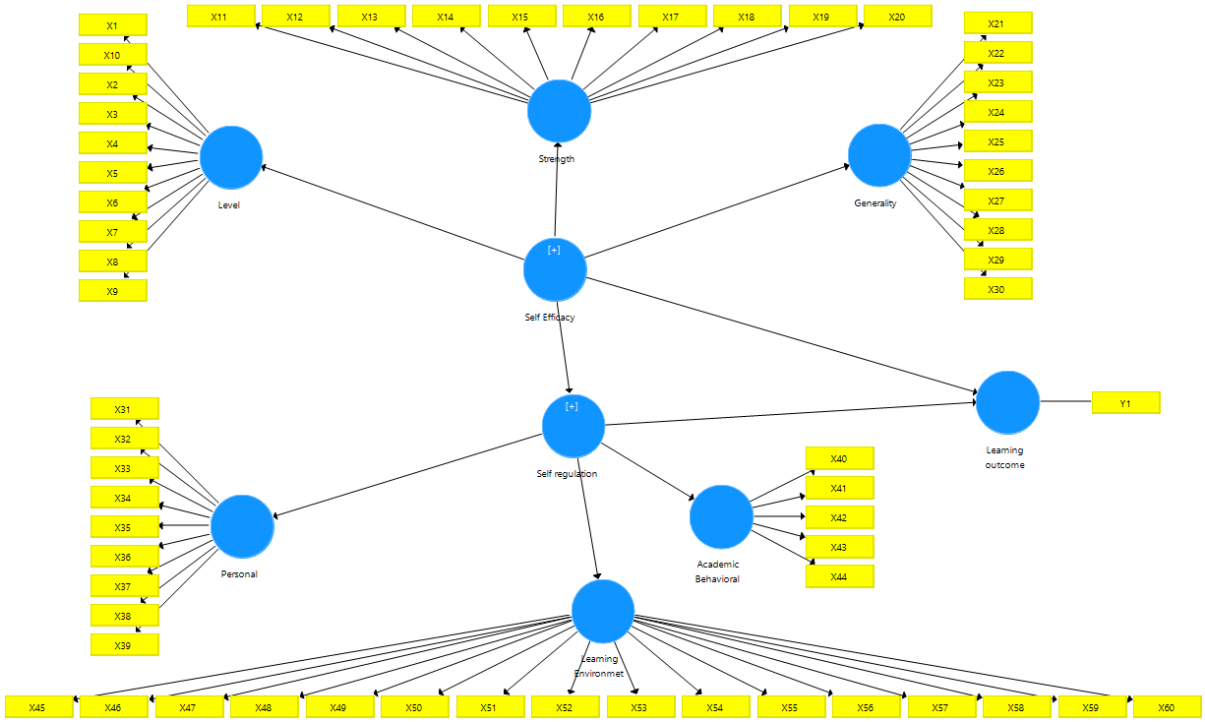

Figure 1.
The first design.

Table 2.
Outer loading of dimensions.

NO	Dimensions	Outer loading
1	X_6 ←Levels	0.818
2	X_{10} ←Levels	0.715
3	X_{14} ← Strength	0.817
4	X_{15} ← Strength	0.687
5	X_{16} ←Strength	0.689
6	X_{19} ← Strength	0.655
7	X_{21} ← Generality	0.791
8	X_{22} ← Generality	0.674
9	X_{23} ← Generality	0.733
10	X_{25} ← Generality	0.732
11	X_{30} ← Generality	0.659
12	X_{34} ← personal	0.625
13	X_{36} ← personal	0.832
14	X_{45} ← Learning Environment	0.592
15	X_{50} ← Learning Environment	0.705
16	X_{51} ← Learning Environment	0.819
17	X_{56} ← Learning Environment	0.669
18	X_{58} ← Learning Environment	0.777
19	X_{40} ← academic behavior	0.730

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NO	Dimensions	Outer loading
20	X_{41} ← academic behavior	0.773
21	X_{44} ← academic behavior	0.818

4.2. Validity Testing

The testing criteria is to accept the outer loading score > 0.5. based on Table 1. The outer loadings that accept are score > 0.5.. The Indicator items X_{36}in the personal dimension have a higher score 0.832 indicating that any changes in the personal dimension will be reflected in the indicator item $X_{32}$of 69.2%. Next, convergent validity by paying attention to the AVE score.

Table 3.
AVE Level dimensions.

NO	Dimensions	AVE
1	Levels	0.591
2	strength	0.511
3	Generality	0.517
4	Personal	0.521
5	Learning environment	0.514
6	academic behavior	0.600

The testing criteria is to accept if the AVE score is > 0.5. based on Table 2. The AVE score of dimensions are > 0.5, that it can be concluded that it meets good convergent validity. The AVE score of the academic dimension is 0.6 its means that the variation in the measurement indicator items in the academic behavioral dimension is 60%.

Table 4.
Composite reliability score.

NO	Dimensions	Composite reliability
1	Levels	0.742
2	Strength	0.806
3	Generality	0.842
4	Personal	0.763
5	Learning environment	0.839
6	Academic behavior	0.818

4.3. Reliability Testing

The test criteria are to accept if the composite reliability score is > 0.7, based on Table 4, the composite reliability score is > 0.7 it can be concluded that overall the measurement indicator items that measure each dimension are consistent or reliable.

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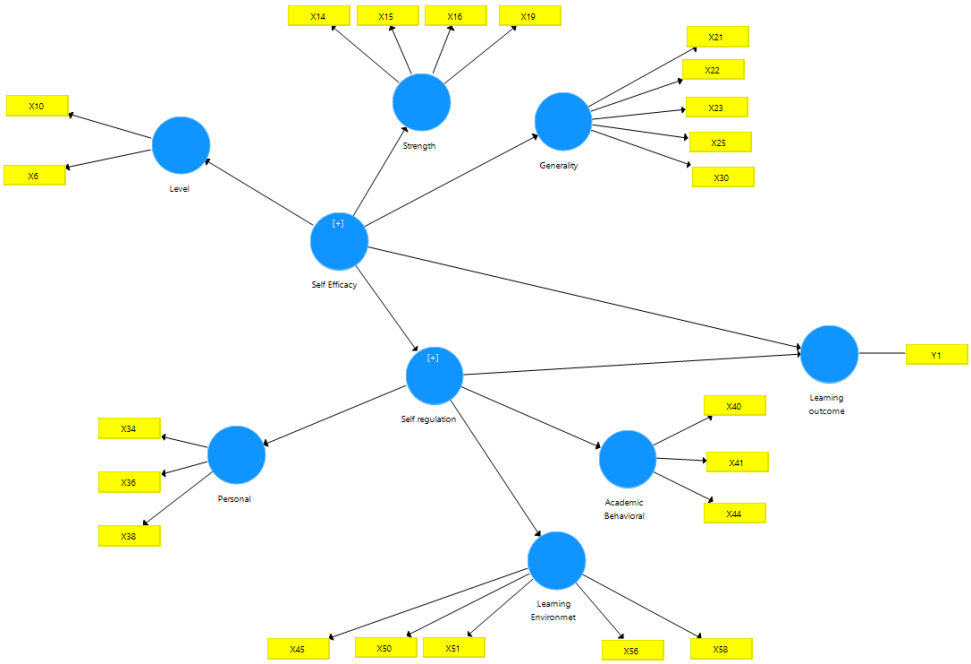

Figure 2.
Evaluation of the first order measurement model.

4.3.1. Second Order

4.3.1.1. Measurement Model

Evaluation of the measurement model is carried out in second order for the dimension level. There are two aspects that will be measured to evaluate the measurement model, namely validity and reliability. The validity test is carried out by paying attention to the outer loading score and Average Variance Extracted (AVE). If the score is from both < 0.5then the item is invalid and will be removed from the indicator. Reliability testing is carried out by paying attention to the Composite reliability score. If the score < 0.7 is then the item is not reliable in measuring. Based on the results of the measurement model evaluation, the following results were obtained.

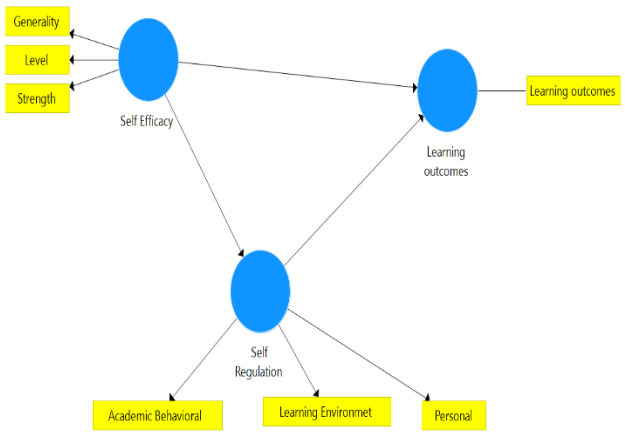

Figure 3.
Second order.

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Table 5.
Outer loading of the variables.

No	Variable	Outer loading
1	Generality← self-efficacy	0.894
2	Levels← self-efficacy	0.760
3	Strength← self-efficacy	0.857
4	Academic Behavioral← self-regulation	0.814
5	Learning environment← self-regulation	0.885
6	Personal← self-regulation	0.876
7	learning outcomes ← learning outcomes	1

4.3.2. Validity Testing

The testing criteria is to accept the outer loading score > 0.5. based on Table 5. The outer loading score is > 0.5 it can be concluded that the indicators are valid for measuring variables. The learning outcomes indicator has a score 1, indicating that every change in the Learning outcomes variable will be reflected in the indicator of 100%. Next, convergent validity by paying attention to the AVE score.

Table 6.
AVE of the variables.

No	Variable	AVE
1	Sefl efficacy	0.703
2	Sefl regulation	0.738
3	Learning outcomes	1

The testing criteria is to accept if the AVE score is > 0.5. Based on Table 6, the AVE score > 0.5 it can be concluded that it meets good convergent validity. The AVE score 1 means that the variations in the indicator contained in learning outcomes variable is 100%.

Table 7.
Composite reliability score.

No	Variable	Composite reliability
1	Learning outcomes	1
2	Self-efficacy	0.876
3	Self regulation	0.894

4.3.3. Reliability Testing

The test criteria are to accept if the composite reliability score is > 0.7, based on Table 7, the composite reliability score > 0.7is so it can be concluded that overall the measurement indicators that measure each variable are consistent or reliable.

Table 8.
Hypothesis testing.

Variable	Efficient	$T_{Statistics}$	P_{values}
Self-efficacy →Learning outcomes	0.026	0.304	0.761
Self-efficacy → Self-regulation	0.519	6.575	0.000
Self-regulation →Learning outcomes	0.246	2.848	0.005
Self-efficacy → Self-regulation →Learning outcomes	0.128	2.4	0.017

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4.4. Structural Model

4.4.1. Hypothesis 1

H_0 : Self-efficacy has a significant influence on learning outcomes

H_1 : Self-efficacy has an influence on learning outcomes but is not significant

The assessment criteria is to accept H_0if the score $T_{statistics} > T_{tabel}$or $P_{Value} < 0.05$. based on Table 8. The score $P_{value} > 0.05$is 0.761, so H_1it can be concluded that Self efficacy has an influence on Learning outcomes but is not significant.

4.4.2. Hypothesis 2

H_0 : Self regulation has a significant influence on learning outcomes

H_1 : Self regulation has an influence on learning outcomes but is not significant

The assessment criteria is to accept H_0if the score $T_{statistics} > T_{tabel}$or $P_{Value} < 0.05$. based on Table 8. The score $P_{value} < 0.05$is 0.005, so it H_0can be concluded that Self efficacy has a significant influence on Learning outcomes.

4.4.3. Hypothesis 3

H_0 : Self efficacy has a significant influence on self regulation

H_1 : Self efficacy has an influence on self regulation but is not significant

The assessment criteria is to accept H_0if the score $T_{statistics} > T_{tabel}$or $P_{Value} < 0.05$. based on Table 8. The score $P_{value} < 0.05$is 0.000, so H_0it can be concluded that self efficacy has a significant influence on self regulation.

4.4.4. Hypothesis 4

H_0 : Self-efficacy has a significant influence on learning outcomes through self-regulation

H_1 : Self-efficacy has an influence on learning outcomes through self-regulation but is not significant

The assessment criteria is to accept H_0if the score $T_{statistics} > T_{tabel}$or $P_{Value} < 0.05$. based on Table 8. The score $P_{value} < 0.05$ is 0.017, so H_0it can be concluded that self efficacy has a significant influence on learning outcomes through self regulation.

Table 9.
R_{square}

Variable	R_{square}
Learning outcomes	0.68
Self regulation	0.27

The size of the proportion of variation in values in the learning outcomes variable can be explained by the self-regulation and self-efficacy variables of 68%. The variation in values for the self-regulation variable can be explained by the self-efficacy variable of 27%.

Table 10.
SRMR.

Criteria	Score
SRMR	0.09

The resulting model has a level of suitability to the data at hand, this is indicated by the SRMR score$0.09 < 0.1$

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5. Discussion

5.1. Self-Efficacy Has a Direct Effect on Learning Outcomes

The first result of this study shows that self-efficacy does not significantly affect the learning outcomes of Islamic Religious Education (PAI). This is shown by a p-value of 0.761 greater than the alpha threshold of 0.05, dnegan coefficient 0.026. this shows that 2 students will have a difference in learning outcome of around 0.026 so the hypothesis is that self-efficacy directly influences learning outcomes but not significant .

These findings contradict several previous studies that show that self-efficacy directly influences learning outcomes (Rorimpandey & Midun, 2021) . For example, research by Fan & Cui (2024) found that self-efficacy positively correlates with academic achievement in the context of transformational leadership. However, the results of this study support the view that other factors may mediate the relationship between self-efficacy and learning outcomes.

The absence of a significant influence of self-efficacy on learning outcomes in the context of this study may be caused by other more dominant factors, such as self-regulation. Fan & Cui (2024) revealed that self-regulation plays an important role in student learning success. Therefore, it is important to examine other factors that may affect student learning outcomes and self-efficacy.

This research aligns with the view that self-efficacy may not always directly affect learning outcomes without strong mediating mechanisms, such as self-regulation (Schunk & Zimmerman, 2011) . In addition, Fan & Cui (2024) also shows that students' interaction with new technologies such as artificial intelligence can strengthen self-efficacy and cognitive engagement, ultimately improving learning outcomes.

Thus, although self-efficacy is important, the results of this study underscore the need to consider other variables, such as self-regulation, which can be more significant in improving student learning outcomes. Further research is needed to comprehensively understand the mechanism that links self-efficacy with learning outcomes.

5.2. The Effect of Self-Efficacy on Self-Regulation

The second result of this study shows that self-efficacy has a significant influence on self-regulation. This is indicated p-value of 0.000, which is smaller than the alpha threshold of 0.05. so the hypothesis that self-efficacy significantly affects self-regulation is acceptable. Then the self efficacy coefficient is 0.519. This shows that two students will have a difference in self-regulation of 0.519.

These findings are consistent with the existing literature, which suggests that self-efficacy plays an important role in improving self-regulation. Schunk and DiBenedetto (2020) note that individuals with high self-efficacy tend to have better self-regulation because they are more confident in overcoming challenges and remain motivated to achieve their goals. Research by Schunk & Zimmerman (2011) also shows that strong self-efficacy supports using more effective self-regulation strategies, such as planning, timing, and self-evaluation.

The significant influence of self-efficacy on self-regulation has important implications for developing educational strategies. Students with high self-efficacy can better regulate themselves in the learning process, improving learning outcomes. Therefore, educational interventions that aim to improve students' self-efficacy can positively impact their self-regulation abilities, as supported by research by Fan & Cui (2024) , which found that self-efficacy significantly predicted self-regulation and psychological well-being.

This study supports previous findings that emphasize the importance of self-efficacy in self-regulation. For example, Usher & Pajares (2008) found that high self-efficacy allows students to be more flexible and adaptive in using self-regulation strategies in various learning situations. In addition, research by Damian et al. (2017) shows that self-efficacy contributes significantly to developing good self-regulation, which improves academic achievement.

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Overall, these findings confirm that improving self-efficacy is important in helping students develop effective self-regulation skills. As such, educators and curriculum developers should consider ways to strengthen students' self-efficacy to improve self-regulation and, ultimately, learning outcomes.

5.3. The Effect of Self-Regulation on Learning Outcomes

The third result of this study shows that self-regulation has a significant influence on learning outcomes. . This is indicated p-value of 0.005, which is smaller than the alpha threshold of 0.05. so the hypothesis that self-efficacy significantly affects outcomes self-regulation is acceptable. Then the self efficacy coefficient is 0.246. This shows that two students will have a difference in learning outcomes of 0.246.

These findings are consistent with many studies that suggest that self-regulation is a key factor in academic achievement. For example, research by Schunk & Zimmerman (2011) shows that students with good self-regulation skills can direct and motivate themselves to learn effectively. Panadero (2017) also shows that self-regulation involves planning, monitoring, and self-evaluation, all of which contribute to the achievement of better learning outcomes

The significant influence of self-regulation on learning outcomes has important implications for educational strategies. Students who can plan, direct, and evaluate their learning efforts tend to achieve higher learning outcomes. Therefore, interventions to improve students' self-regulation can significantly improve their academic performance. This research emphasizes the importance of developing self-regulation skills in the educational curriculum to ensure students reach their maximum academic potential.

This research supports the existing literature on the importance of self-regulation in learning. For example, research by Schunk & Zimmerman (2011) shows that self-regulation helps students stay focused on their tasks, overcome distractions, and manage academic stress, ultimately improving their learning outcomes. In addition, research by Yokoyama (2019) and Damian et al. (2017) showed that good self-regulation contributes significantly to academic achievement by increasing student motivation and persistence.

Overall, these findings underscore the importance of self-regulation in education. Developing effective strategies to improve student self-regulation should be a priority for educators and policymakers. By improving self-regulation, students will be better able to achieve their academic goals and improve overall learning outcomes.

5.4. The Effect of Self-Efficacy on Learning Outcomes through Self-Regulation

The fourth result of this study shows that self-regulation plays a significant role as an intervening variable in the influence of self-efficacy on learning outcomes. . This is indicated p-value of 0.017, which is smaller than the alpha threshold of 0.05. so the hypothesis that self-efficacy significantly affects learning outcomes through self-regulation is acceptable. Then the coefficient of self-efficacy through self-regulation is 0.128. This shows that two students will have a difference in learning outcomes of 0.128

These findings support previous research that shows that self-efficacy influences learning outcomes through self-regulation. Zimmerman & Kitsantas (2014) and Schunk & DiBenedetto (2020) found that high self-efficacy encourages better self-regulation strategies, such as self-planning and monitoring, which improves learning outcomes. In addition, research by (Usher & Pajares, 2008) shows that self-regulation mediates the relationship between self-efficacy and academic achievement, emphasizing the importance of self-regulation as a mechanism through which self-efficacy affects learning outcomes.

These findings also have important implications for the development of effective educational interventions. Considering that self-regulation is an intervening variable, efforts to improve students' self-efficacy must be accompanied by self-regulation training to maximize learning outcomes. In other words, increasing students' self-efficacy is not enough; There needs to be an emphasis on developing effective self-regulation skills to significantly improve learning outcomes. Research by Fan & Cui (2024)

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also emphasizes that interventions that simultaneously increase self-efficacy and self-regulation are more effective in improving students' academic performance.

This study confirms previous findings that self-regulation is a key mechanism of self-efficacy affecting learning outcomes. For example, research by Panadero (2017) shows that self-regulation helps students cope with distractions and manage academic stress, ultimately improving their learning outcomes. Research by Damian et al. (2017) also shows that good self-regulation strengthens the relationship between self-efficacy and academic achievement, highlighting the importance of self-regulation as an intervening variable.

Overall, these findings underscore the need to develop educational strategies that improve students' self-efficacy and self-regulation skills. As such, educators and policymakers should focus on developing programs that integrate these two aspects to achieve more effective and sustainable learning outcomes.'

6. Conclusions

It turns out that the results of the study show that: self-efficacy does not have a significant effect on learning outcomes directly. This study found that self-efficacy did not significantly influence the learning outcomes of Islamic Religious Education (PAI). This suggests other factors may mediate the relationship between self-efficacy and learning outcomes. Then, it was found that self-efficacy had a significant effect on Self-Regulation. The findings show that self-efficacy has a significant influence on self-regulation. Students with high self-efficacy are better able to regulate, monitor, and evaluate their learning process, demonstrating the importance of self-confidence in self-efficacy for developing effective self-regulation.

Furthermore, Self-Regulation is a predictor of Learning Outcomes. Students who can plan, direct, and evaluate their learning efforts are likely to achieve higher learning outcomes. It emphasizes the importance of self-regulation skills in academic achievement. The latest findings show that self-regulation plays an intervening variable in the influence of self-efficacy on learning outcomes. This means that self-efficacy affects learning outcomes indirectly through self-regulation. High self-efficacy promotes better self-regulation, which in turn improves learning outcomes.

6.1. Implications

This research makes an important contribution to education, especially in understanding the factors that affect the learning outcomes of Islamic Religious Education (PAI) in Indonesia. Here are some of the key contributions from the results of this study: This study highlights that self-regulation significantly influences learning outcomes. These findings support previous literature suggesting that students' ability to plan, direct, and evaluate their learning endeavors is key to academic success. Thus, this study emphasizes developing self-regulation skills in the educational curriculum. This study also found that self-efficacy does not directly affect PAI learning outcomes but affects learning outcomes indirectly through self-regulation. This adds to the understanding that students' confidence in their abilities (self-efficacy) contributes to their academic success when combined with good self-regulation.

Furthermore, the findings that self-efficacy has a significant effect on self-regulation and that self-regulation has a significant effect on learning outcomes suggest that educational interventions designed to improve students' self-efficacy should also include self-regulation training. Interventions that focus on these two aspects simultaneously can improve students' academic performance more effectively. Overall, this study makes a valuable contribution by highlighting the importance of self-regulation in education and offering insights for more effective educational strategies.

6.2. Limitations and Suggestions for Further Research

This research has limitations that can be completed by subsequent research. The limitation of this study is the limited number of schools studied, so the results may not be generalized to all schools in Indonesia. The limited number of samples may also affect the external validity of the findings of this

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study. Furthermore, this study uses a quantitative method with an ex post facto design, which may not fully capture the complexity of the relationship between self-efficacy, self-regulation, and learning outcomes. More diverse research methods, such as the mixed method, can provide a more comprehensive understanding of the phenomenon being studied. Then, this study has not considered demographic variables such as gender, age, and educational background that may affect self-regulation and learning outcomes. Future research needs to consider these aspects to get a more complete and in-depth picture of the factors that affect PAI learning outcomes. By overcoming these limitations, future research can contribute more comprehensively to the development of effective educational strategies for improving student learning outcomes.

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