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# Peer Relationships, Academic Motivation, Academic Self-Efficacy, and Student Achievement: Moderated Mediation Model

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## Abstract

This study utilizes statistical approaches and hypothesis testing to explore the relationships among variables in the context of peer relationships, academic motivation, academic self-efficacy, and economic learning outcomes among 10th-grade students at Surabaya Public Senior High School 12. It employs a quantitative research design with a sample of 191 10th-grade students from Surabaya Public Senior High School 12. Data collection is conducted through a Likert-scale questionnaire, which is then analyzed using descriptive statistics, correlation analysis, and moderated mediation analysis using the PROCESS Hayes Model 7 method. The results of the study indicate significant relationships among the variables under investigation. Peer relationships (PR) have a positive impact on academic motivation (AM), academic self-efficacy (ASE), and economic learning outcomes (EO). Similarly, the relationship between academic motivation and economic learning outcomes also shows a positive impact. Furthermore, it is found that academic motivation mediates the relationship between peer relationships and economic learning outcomes. Academic self-efficacy also moderates the relationship between peer relationships and academic motivation, where this moderating effect reduces the strength of the expected mediation effect.

## How to Cite

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## INTRODUCTION

Education nowadays tends to focus more on developing 21st-century skills which are integrated in knowledge, skills and attitudes as well as mastery of ict which is developed through: (1) critical thinking and problem solving skills; (2) communication skills; (3) creativity and innovation skills; and (4) collaboration skills (Jeniah et al., 2024). As educated individuals, students undergo continuous self-transformation, signifying a process of learning. The learning process experienced always yields an output often referred to as learning outcomes (Wibowo, 2020). Learning outcomes are related to changes in students, both in cognitive, affective, and psychomotor aspects (Pingge & Wangid, 2016). Or simply put, these learning outcomes can be said to be changes in students as a result of their learning experiences (Julyanti, 2021).

In an attempt to explain the academic and psychological functions of students, the Self-Determination Theory (SDT) is one of the most significant theoretical frameworks. This theory systematically explores the relationship between a sense of connection and students' educational outcomes (Deci & Ryan, 2012). Achievement of learning outcomes is influenced by various factors, one of which is the significant role of peer relationships in the school environment, as most of a student's time is spent at school (Najah et al., 2022; Raufelder et al., 2013). Peer relationships occur due to social interaction with peers. Social interaction with peers plays a significant role in enhancing an individual's abilities related to increased initiative and academic participation (Danielsen et al., 2010; Hosan & Hoglund, 2017; Laursen & Veenstra, 2021). Because they know when and how to obtain information, especially from peers who often spend time together, both during and outside of learning (Rachmaningtyas & Khoirunnisa, 2022). Therefore, interaction with peers becomes another important factor that can influence academics.

Self-Determination Theory (SDT) encompasses three basic human needs: autonomy, competence, and relatedness (Deci & Ryan, 2000). Meeting these needs can enhance intrinsic motivation and improve learning outcomes. Peers play a crucial role in fulfilling the need for autonomy (Ruzek et al., 2016). When students are faced with various academic tasks given by teachers to assess their progress during the learning process, the presence of peers becomes a source of support that reinforces students' competence and can increase students' confidence in their ability to succeed in completing academic tasks. This belief in one's abilities is often referred to as academic self-efficacy, which plays a significant role in a student's academic achievement (Bandura, 1997). According to Arslantas (2021), one important concept in translating self-belief into tangible results is motivation. Motivation is a crucial factor in the student learning process. Peer academic support and peer relationships have also been shown to positively contribute to students' academic motivation (Shin & Bolkan, 2021). High academic motivation can be a determining factor in learning success (Deci & Ryan, 2000; Muhammad, 2017). This motivation can develop student initiative and activity, leading to positive outcomes. Thus, the learning process is considered effective when students can become more independent (Rusli et al., 2021), build their confidence (Trinova, 2012), and increase their motivation levels (Sappaile et al., 2023).

Peer relationships can also indirectly influence academic achievement through student motivation, self-efficacy, and other factors affecting academic performance (Bakadorova & Raufelder, 2016). However, research conducted by Kumalasari & Kasidi (2021) indicated that self-efficacy and peer relationships did not significantly affect economic subject learning achievement. In a study by Mazzetti et al., (2020) it was revealed that there was a moderating effect of academic self-efficacy on the relationship between future orientation and learning achievement. However, in a stu-

dy conducted by Cattelino et al. (2021) self-efficacy as a moderated mediation between peer relationships and academic performance stated that the size of the association was weaker in students with few peers.

Based on the research conducted by Damayanti et al. (2021), it shows a positive and significant relationship between peer social interaction and student learning motivation. Student motivation is a very significant factor, meaning the relationship between academic motivation and academic achievement is significantly positive, indicating that high academic motivation can drive students to achieve academic success (Alafgani & Purwandari, 2019; Taurina, 2015). While the research conducted by Siregar (2023) indicated that there is an influence, however, not significant, between the relationship of learning motivation and student learning outcomes. Consistent with the research conducted by Rahmania & Wahyuni (2022) it was shown that the influence of learning motivation on learning achievement is very low. This means that motivation has a significant but low level of significance.

Learning outcomes are achieved when students demonstrate the expected development and improvement in behavior that aligns with the learning objectives. This is typically assessed by teachers through quizzes or exams. Students succeed in learning when they meet these objectives, which are reflected in their overall understanding of the learning material (Salam, 2019). The Minimum Completion Criteria (KKM) is the student achievement limit that must be exceeded, so that the student is considered successful in participating in learning activities at school (Kumalasari & Kasidi, 2021). Therefore, students' learning outcomes can be seen from the Minimum Completion Criteria limit. The achievement of learning outcomes is considered high if students have surpassed the established minimum standards, which can be seen from the test results obtained. Conversely, academic achievement is considered low if students have not reached these minimum standards or if the test results obtained are low.

Observations conducted from August 2023 to January 2024 at SMA Negeri 12 Surabaya, specifically in grade 10, which consists of 10 classes with each class comprising 36 to 37 students, showed a significant decline in learning outcomes for economics subjects in daily test scores. This decline has been identified as being due to several main factors: peer relationships, academic self-efficacy, and academic motivation.

Gaps in peer relationships have become one of the factors affecting learning outcomes. This gap is clearly visible when teachers ask students to form discussion groups. In case study discussions on economics, for example, students tend to choose friends whom they consider capable of collaborating and making significant contributions. As a result, students who are considered less participative are often left out and not involved in the discussion groups. This gap can affect their enthusiasm and self-confidence, which ultimately negatively impacts their academic performance in economics.

Low academic self-efficacy makes students lack confidence in completing their academic tasks. Students who feel incapable or lack self-confidence tend to avoid challenges, give up more quickly, and have low resilience to failure. This directly affects the quality and quantity of effort they put into learning, which ultimately negatively affects their learning outcomes.

Furthermore, low academic motivation exacerbates the situation. Students who do not have an intrinsic drive to learn tend to complete tasks just to meet requirements or avoid punishment, without any interest or desire to understand the material deeply. As a result, students find economics lessons boring and irrelevant to their interests, leading to low learning outcomes.

According to Self-Determination Theory (Deci & Ryan, 1985), boredom can arise when basic psychological needs, such as the need for competence, relatedness, and autonomy, are not met. When students feel bored, they tend to be less motivated and less

engaged in the learning process, resulting in decreased academic performance. This causes some students to have low learning outcomes and to achieve the minimum passing grade, they must undergo remedial exams.

The field data obtained showed that 56% of the 365 students were still low or below the completeness criteria, while the completeness score set by the school was 72. If this situation is not addressed, it can have negative impacts on students and educational institutions. Therefore, improving students' learning outcomes must be a top priority, continuously pursued through enhancing peer relationships, academic self-efficacy, and academic motivation, and learning outcomes in economic subjects among among tenth-grade students at SMA Negeri 12 Surabaya.

**Peer Relationships and Learning Outcomes**

According to Santrock et al. (1980), "Peers are children of approximately the same age and maturity level." Peers are related to individuals who share similar ages, backgrounds, or experiences. They tend to have similarities in terms of age, interests, life stages, or specific contexts that place them in similar groups (Bukowski et al., 2000). For example, in an educational context, peers refer to classmates or peers of the same age group in the educational environment (Wentzel et al., 2004). The relationship with peers provides aspects such as friendship and enjoyment, assistance in problem-solving, recognition of personal identity, emotional support, and also aids in the development of children's identity during childhood and adolescence (Wentzel, 2017). Consequently, they encourage students to participate actively in class and feel engaged, thereby enhancing their learning outcomes (Fadhilah & Mukhlis, 2021; Li, Peng, et al., 2020).

According to Wentzel (2017), interactions with peers can be categorized into three specific types: (1) the level of acceptance or rejection by a larger peer group; (2) membership in peer groups, typically determined by recognition of students who are friends with each other; and (3) Peer friendship: reflects relatively individual and shared relationships usually formed based on specific criteria. According to Wentzel & Muenks (2016), each of these three categories has been associated with various skills related to education, including various aspects of self-efficacy, motivation, and academic achievement (Li, Liu, et al., 2020). Interactions with peers can indirectly influence academic performance through student motivation, self-confidence, and other factors that support school performance (Bakadorova & Raufelder, 2016). Therefore, this study will investigate the direct and indirect impacts of peer relationships on economic learning outcomes, focusing on the role moderated by academic self-efficacy and mediated by academic motivation.

**Academic Self-Efficacy and Learning Outcomes**

According to Bandura (1997), academic self-efficacy refers to an individual's belief in their ability to organize and execute a series of steps necessary to achieve a particular goal. Academic self-efficacy is also described as an individual's belief in their ability to complete academic tasks at a certain level (Schunk & Panjares, 2002). Bandura (1997) reveals that the difference in self-efficacy among individuals lies in three components: (1) task difficulty level (magnitude): relates to how difficult the tasks faced by an individual are; (2) belief strength (strength): relates to how strong an individual's belief in their ability is; and (3) generality: relates to how broad the range of behaviors in which someone feels confident about their abilities.

Self-efficacy plays a crucial role in students' learning success (Zagoto, 2019). Academic self-efficacy is indeed related to measures of learning outcomes (Zysberg & Schwabsky, 2021). According to Bandura (1977), individuals tend to do what they believe they can do and avoid what they perceive they cannot do. This belief helps them feel capable of completing tasks and enhances their motivation to learn, which in turn improves their academic

achievement. As students complete tasks, they receive feedback from themselves, while the progress of other students provides feedback that can boost self-efficacy and strengthen motivation, subsequently enhancing performance (Schunk & DiBenedetto, 2020). However, if relationships with peers are negative, students' self-confidence may decrease, and they may feel hesitant in completing academic tasks, which can ultimately lower academic motivation. The importance of self-efficacy in mediating the correlation between peer relationships and motivation remains an understudied issue. Therefore, this study aims to explore whether self-efficacy can act as a moderating variable that influences the relationship between peer relationships and academic motivation.

**Academic Motivation and Learning Outcomes**

According to the Self-Determination Theory (SDT) proposed by Edward Deci and Richard Ryan, this theory states that the motivation perceived by an individual when performing a task is set along a "continuum," ranging from high to low levels of self-determination. Motivation is an internal process that propels individuals towards achieving a goal, influenced by the dynamic interaction among cognitive, emotional, and environmental factors (Bandura, 1997; Wigfield & Eccles, 2002). According to Wigfield & Eccles (2000), academic motivation involves how interested and engaged individuals are in academic activities, including their perceptions of the importance of success in education.

When students complete tasks, they provide feedback to themselves, while others receive active feedback regarding their learning progress, which in turn enhances self-efficacy and drives sustained motivation and achievement (Schunk & DiBenedetto, 2020). Intrinsic motivation has been observed in high school students and is related to peer relationships and academic achievement (Wentzel, 2017). Vecchione et al. (2014) revealed that academic achievement has a good relationship with academic motivation, meaning students with high academic motivation can improve their academic achievement. Academic achievement is the main driving motivation for students to achieve their goals. The results indicate that motivation can serve as a significant mediator in the relationship between peer relationships and academic achievement. Therefore, this study hypothesizes that the level of academic motivation can impact students' learning achievement.

The hypothesis in this research is as follows.

H1. Peer relationships significantly influence academic motivation.

H2. Academic self-efficacy significantly influences academic motivation.

H3. Peer relationships significantly influence economic learning outcomes.

H4. Academic motivation significantly influences learning outcomes.

H5. Peer relationships significantly influence economic learning outcomes through academic motivation.

H6. Academic self-efficacy moderates the pathway of influence between peer relationships and academic motivation.

## METHODS

The method applied in this study is a quantitative approach. This approach prioritizes the use of numbers, statistics, and hypothesis testing to explain phenomena, identify patterns, or understand relationships between variables (Salkind, 2010). The main objective of this study is to explore the relationship between peer relationships, academic motivation, academic self-efficacy, and economic learning outcomes. This research was conducted at a high school in Surabaya, East Java, Indonesia. The subjects of this study are 10th-grade students aged 14-15 years who are attending classes at SMA Negeri 2 Surabaya. Therefore, the research design can be seen in Figure 1.

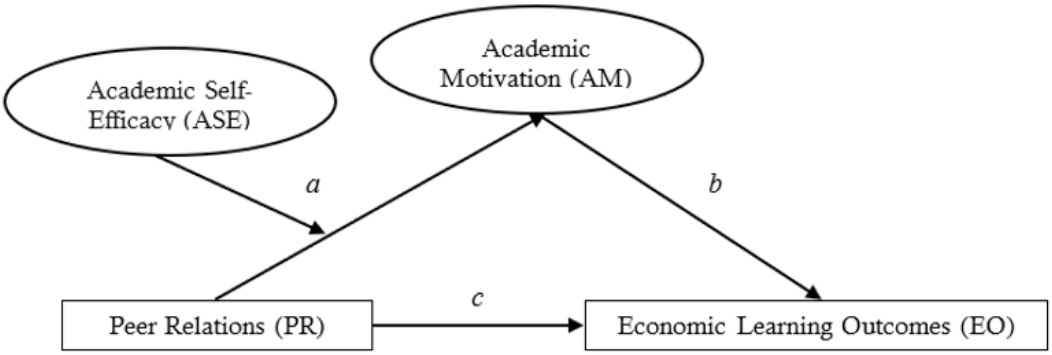


**Figure 1.** Research Plan

Hypotheses must be empirically testable statements that encompass all levels of analysis statements about something that must be observed in the real world if the theory is correct (Babbie, 2021).

In this study, the population consists of the total number of students in grade 10 of SMA Negeri 12 Surabaya, amounting to 365. Based on the final calculation results of the formula, the total sample size used in this study is 191. The sampling was conducted using the Simple Random Sampling method, which means the samples were taken randomly without considering strata or specific characteristics of the population from which the samples were drawn (Salkind, 2010).

This research utilizes primary data sources obtained from questionnaires. The primary objective of the questionnaire in the study is to acquire relevant information in the most reliable and valid manner possible (Taherdoost, 2018). The questionnaire is closed-ended with Likert scale response alternatives, which provide a balanced list of alternatives from which respondents can choose to indicate their response to statements or questions (Salkind, 2010). The Likert scale assessment can be seen in the Table 1.

**Table 1.** Likert Scale

| Response | Score |
|---|---|
| Strongly agree | 5 |
| Agree | 4 |
| Somewhat agree | 3 |
| Disagree | 2 |
| Strongly disagree | 1 |

Source: Salkind (2010)

The peer relationship questionnaire is measured by the subscale "adopting the LO-SO-Project research questionnaire instrument (Longitudinal Research in Secondary Education)" compiled by Damme et al. (2002). Consists of ten items comprising statements about perceived positive and negative relationships with peers, with five items for each aspect.

The academic self-efficacy questionnaire is measured by the subscale "Academic Self-Efficacy (ASE)" developed by Jerusalem and Schwarzer in Germany in 1981 and adapted in Turkey by Yilmaz et al. (2007). It consists of seven items with three indicators: magnitude, strength, and generality (Bandura, 1997).

The academic motivation questionnaire is measured by adopting the instrument "Academic Motivation Scale (AMS)" subscale "Intrinsic Motivation (IM)" compiled by Vallerand & Al (1992) and validated by Utvær & Haugan (2016). It consists of 12 items with three indicators: IM for knowledge, IM for achievement, and IM for stimulating experience.

In this study, learning outcomes, which are the dependent variable (Y), use data from

the Mid-Semester Summative Assessmentt (STS) for the even semester of the academic year 2023/2024 in the subject of economics.

First, the data was analyzed using descriptive statistics and correlation. Second, the PROCESS Hayes (2018) was employed to test the moderated mediation model. This method is used to test mediation or moderation of relationships between specific variables in a more detailed and structured manner. This method can provide a deeper understanding of how and to what extent mediator or moderator variables influence the relationship between independent and dependent variables. Analysis of Model 7 in this method revealed both direct and indirect effects. This model tests whether the mediation from the independent variable (X) to the dependent variable (Y) through the mediator (M) is influenced by the moderator (W). In this model, moderator W influences the path from X to M. A bootstrap method with 5000 samples was utilized to generate a 95% Confidence Interval (CI), which was bias-corrected and accelerated for the moderated mediation model. This means that the estimates derived from the resampled data provide 95% confidence that the true values fall within the calculated confidence interval.

## RESULT AND DISCUSSION

In the initial stage, preliminary analysis is conducted, namely descriptive statistical analysis and correlation of all measurement tools in this study. Descriptive statistical tests are used to provide an overview of the distribution and characteristics of each variable observed in the study, then the data are systematically and concisely presented.

Table 2 presents the results of descriptive statistics for all variables. The data indicate that the PR value has a mean of 36.4084 with a range of values between 17 and 50. This finding suggests that a higher mean value indicates that students tend to have better relationships with their peers. The AM has a mean value of 50.1390 with a range of values between 26 and 60. This indicates that overall, students have a fairly high level of academic motivation. The ASE has a mean value of 26.3194 with a range of values from 14 to 35. This shows that a low mean value indicates that most students have a relatively low level of academic self-confidence, but with an average value around the range of values, it indicates that students have varied levels of confidence in their academic abilities. And EO has a mean value of 79.3403 with values ranging from 72 to 94. This means that overall, students have fairly high economic learning outcomes, with a range of values from 72 to 94. It can be concluded that despite variations in perceptions regarding peer relationships and academic self-efficacy, students in grade 10 of SMA Negeri 12 Surabaya have relatively high levels of academic motivation and learning outcomes.

**Table 2.** Descriptive Statistics

| Variabel | Min | Max | Mean | Std. Deviation |
|---|---|---|---|---|
| PR | 17 | 50 | 36.4084 | 10.87928 |
| AM | 26 | 60 | 50.1390 | 8.64009 |
| ASE | 14 | 35 | 26.3194 | 4.53728 |
| EO | 72 | 94 | 79.3403 | 6.80900 |

Source: Processed Primary Data (2024)

**Table 3.** Correlation Among Variables

| Variabel | PR | AM | ASE | EO |
|---|---|---|---|---|
| PR | 1 | | | |
| AM | 0.323** | 1 | | |
| ASE | 0.152* | 0.495** | 1 | |
| EO | 0.419** | 0.395** | 0.113 | 1 |

Note: * = Significant at the .05 level; ** = Significant at the .01 level. N=191

Source: Processed Primary Data (2024)

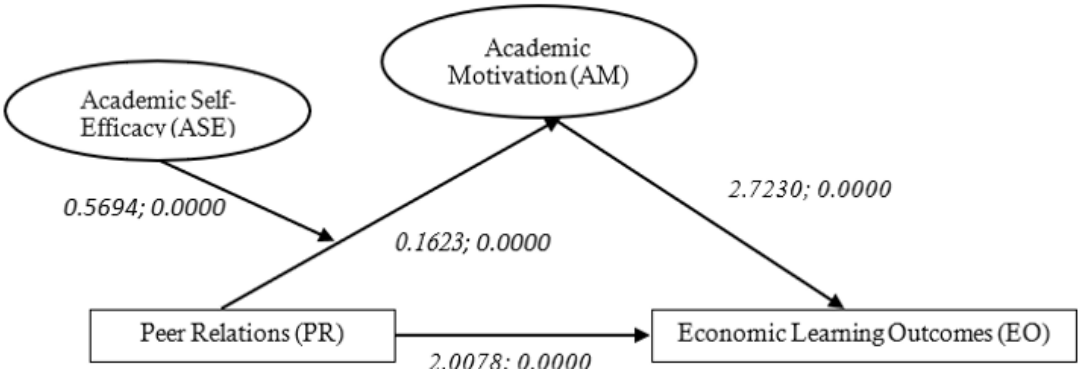


**Figure 2.** Statistical Diagram Of Process Macros Hayes V4.2 Model-7 Output

**Table 4.** Model Summary and Coefficients (Process Macros Hayes V4.2 Model 7)

| | Model | R | $R^2$ | MSE | F | P | Outcome |
|---|---|---|---|---|---|---|---|
| Model Summary | Model 1 | 0.6098 | 0.3718 | 0.3306 | 36.8949 | 0.0000 | AM |
| | Model 2 | 0.4979 | 0.2479 | 35.2385 | 30.9930 | 0.0000 | EO |
| | Model | Coeff | t | P | LLCI | ULCI | Outcome |
| Coefficient | Constant | 4.2062 | 99.4509 | 0.0000 | 4.1228 | 4.2765 | AM |
| | PR | 0.1623 | 4.1645 | 0.0000 | 0.0854 | 0.2391 | AM |
| | ASE | 0.5694 | 8.5381 | 0.0000 | 0.4378 | 0.7009 | AM |
| | Int_1 | -0.2130 | -3.7501 | 0.0002 | -0.3251 | -0.1010 | AM |
| | Constant | 67.9644 | 25.3033 | 0.0000 | 62.6659 | 73.2630 | EO |
| | PR | 2.0078 | 4.7942 | 0.0000 | 1.1816 | 2.8339 | EO |
| | AM | 2.7230 | 4.2905 | 0.0000 | 1.4710 | 3.9750 | EO |

Source: Processed Primary Data (2024)

Correlation analysis assesses the relationship between variables, revealing their strength. Table 3 data shows a significant link between peer relationships (PR) and academic motivation (AM), academic self-efficacy (ASE), and learning outcomes (EO). Better peer relationships correlate with higher AM, ASE, and EO levels. However, the PR-ASE link, while significant, is weaker compared to PR-AM. Academic motivation strongly correlates with ASE and EO: higher AM relates to increased ASE and EO. Conversely, ASE shows no significant correlation with EO, suggesting no strong link between self-efficacy and academic performance in economics.

**Moderated Mediation Analysis**

The determination coefficient test is conducted to evaluate how well the model can explain the dependent variable by considering the independent variables simultaneously, as reflected in the adjusted R-Squared value. The determination coefficient can be found in the R-square (R2) value in the model summary table.

From table 4, it can be observed that the R-square value in model 1 is 0.3718 or 37.18%, indicating that variables PR and ASE collectively influence variable AM by 37.18%. In model 2, the R-square value is 0.2479 or 24.79%, meaning that variables PR and AM

collectively influence EO by 24.79%. The results of the variable relationships can be seen in Figure 2.

From the results of the variable relationships shown in table 5, it can be interpreted that the PR significantly influences AM (β = 0.1623, t = 4.1645, P < 0.05), thus H1 is accepted. ASE significantly influences AM (β = 0.5694, t = 8.5381, P < 0.05), thus H2 is accepted. The PR significantly influences EO (β = 2.0078, t = 4.7942, P < 0.05), thus H3 is accepted. AM significantly influences EO (β = 2.7230, t = 4.2905, P < 0.05), thus H4 is accepted.

To determine how the moderator influences the indirect effect between the PR variable and EO, it is necessary to consider both direct and indirect effects. Based on the results in table 6, the direct effect value is 2.0078, while the indirect effect value is 0.4418. The indirect effect at a 95% confidence level has a confidence interval between 0.3696 and 1.3740. In other words, these indirect effect values are considered significant and do not include zero. Thus, the analysis results indicate that academic motivation partially mediates the relationship between peer relationships and learning outcomes. The PR variable has a significant effect both directly and indirectly on the EO variable. Therefore, it can be concluded that H5 is accepted, meaning that academic motivation mediates the relationship between peer relationships and economic learning outcomes.

The indirect effect value (0.8183) indicates the effect size when the AM variable is at -1 standard deviation from the mean. The 95% confidence interval (from LLCI = 0.3519 to ULCI = 1.3686). The t-statistic value (3.1643) indicates that this indirect effect is statistically significant at a 95% confidence level. Meanwhile, at +1 standard deviation from the mean,

**Table 5.** Variable Relationships (Process Macros Hayes V4.2 Model 7

| Direct Relationship | Unstandardized Coefficient | T values | P |
|---|---|---|---|
| PR → AM | 0.1623 | 4.1645 | 0.0000 |
| ASE → AM | 0.5694 | 8.5381 | 0.0000 |
| PR * ASE → AM | -0.2130 | -3.7501 | 0.0002 |
| PR → EO | 2.0078 | 4.7942 | 0.0000 |
| AM → EO | 2.7230 | 4.2905 | 0.0000 |

Source: Processed Primary Data (2024)

**Table 6.** Direct and Indirect

| Indirect Relationship | Direct Effect | Indirect Effect (SE) | Confidence Interval Low/High | T values |
|---|---|---|---|---|
| PR → AM → EO | 2.0078 | 0.4418 (0.1533) | 0.3696/1.3740 | 2.8819 |
| Probing Moderated Indirect Relationship | Effect | SE | Confidence Interval Low/High | t-statistic |
| Low Level of ASE | 0.8183 | 0.2586 | 0.3519/1.3686 | 3.1643 |
| High Level of ASE | 0.0654 | 0.1399 | -0.2134/0.3581 | 0.4674 |

Source: Processed Primary Data (2024)

the indirect effect value (0.0654). The 95% confidence interval (from LLCI = -0.2134 to ULCI = 0.3581). The t-statistic value (0.4674) indicates that this indirect effect is not statistically significant at a 95% confidence level.

Thus, the analysis indicates that when the mediator is at -1 standard deviation from the mean, the indirect effect is statistically significant. However, when the mediator is at +1 standard deviation from the mean, the indirect effect is not statistically significant. This suggests that the mediator (AM) moderates the relationship between PR and EO in the indirect effect. In other words, the indirect effect from PR to EO through AM changes depending on the value of AM itself. Therefore, in this study, the mediator may have a significant moderating role when its value is low (-1 SD), but it does not have a significant moderating effect when its value is high (+1 SD).

**Table 7.** Index of Moderated Mediation

| Index | Boot SE | Boot LLCI | Boot ULCI | t-statistic |
|---|---|---|---|---|
| -0.5801 | 0.2188 | -0.2054 | -0.3718 | 2.6512 |

Source: Processed Primary Data (2024)

Based on the results in table 7, the index of moderated mediation value (-0.5801) indicates the extent of moderation occurring on the mediation effect by the moderator variable. In this case, the negative value indicates that moderation reduces the mediation effect. The 95% confidence interval (from LLCI = -0.2054 to ULCI = -0.3718) indicates that with a 95% confidence level. The t-statistic value (2.6512) indicates that the mediation index is significantly moderated statistically at a 95% confidence level. Therefore, the analysis results indicate that there is moderation on the mediation effect by the moderator variable. Thus, H6 is accepted, indicating significant moderation reducing the mediation effect.

**The Mediation Effect of Academic Motivation**

This study notes that academic motivation significantly acts as a mediator in the correlation between peer relationships and economic learning outcomes among 10th-grade students at SMA Negeri Surabaya, as indicated in table 5. The mediation in this study shows that a positive relationship with peers can lead to high academic motivation. This is consistent with previous research (Li, Liu, et al., 2020; Li, Peng, et al., 2020). According to Yulianda & Syofyan (2018), peer relationships contribute to academic motivation. The findings of this study are also consistent with research conducted by Damayanti et al. (2021); Oktavia & Dewi (2021); Wijaya & Widiasavitri (2019). The better the relationship with peers, the higher the academic motivation of students. Conversely, the lower the relationship with peers, the lower the academic motivation of students. For example, support in doing assignments together or in discussing solutions to the problems given by teachers can increase enthusiasm for learning. Thus, the more positive the peer relationships, the students will feel they have high academic motivation because they feel supported by their peers, have a sense of attachment and concern, and have friends to discuss with in understanding the material provided by teachers. This can increase students' motivation and engagement in the learning process, which ultimately facilitates the development of academic learning outcomes (Lo et al., 2022).

In addition, increased motivation can also improve economic learning outcomes (Annauval & Ghofur, 2021; Ningtiyas & Surjanti, 2021; Rochmah & Kurniawan, 2022). Furthermore, peer relationships with learning outcomes also have a significant impact, consistent with research conducted by Khumaero & Arief (2017); Maheni (2019); Rahayu (2018). If students receive support from peers and a positive surrounding environment, it will positively impact their learning outcomes. However, if students receive support from a negative peer environment, it will negatively affect their learning outcomes. Therefore, this model indicates that high academic motivation is not only caused by a positive relationship with peers but also influences the academic performance of 10th-grade students at SMA

Negeri 12 Surabaya. Academic motivation plays a crucial mediating role between peer relationships and academic performance. In other words, the higher the relationship with peers and academic motivation, the higher the academic performance (Tu & Chu, 2020). Additionally, this study also found a positive and significant relationship between academic motivation and academic performance, consistent with the findings reported by Affuso et al. (2023).

According to SDT theory, According to SDT theory, higher and sustained motivation occurs when individuals feel in control of their actions (autonomy), competent in performing specific tasks, and socially connected to others (Deci & Ryan, 1985). This emphasizes the importance of social environment support in facilitating more autonomous and value-based motivation. In the context of this study, peers can play a role as part of students' social environment influencing their academic motivation in learning. Because students' peer environments shape their personalities in continuously forming relationships with others (Rahayu, 2018). The finding that academic motivation mediates the relationship between peers and economic learning outcomes can be interpreted as a result of the autonomy and competence experiences gained by students through interactions with peers, which then influence their motivation to learn. Children who have positive interactions with their peers are more motivated in their academic tasks (Damayanti et al., 2021; Wentzel, 2005). This means that the higher the social interaction with peers, the higher their motivation (Damayanti et al., 2021). Therefore, this can lead to higher academic achievements. By being in an environment where peers value high academic performance, students will have higher academic motivation due to peer interactions, ultimately enhancing their academic performance (Nelson & Debacker, 2008). Therefore, the mediating role of motivation becomes crucial in linking the influence of peer relationships to students' learning outcomes.

**The Moderation Effects of Academic Self-Efficacy**

This study indicates that academic self-efficacy moderates the relationship between peer relationships and academic motivation. This is consistent with research conducted by Li, Liu, et al., (2020); and Li, Peng, et al. (2020). Academic self-efficacy also significantly influences academic motivation. This is also consistent with research conducted by Prihatini et al. (2018); Aryanti & Muhsin (2020); Jatmiko (2019). Academic self-efficacy acts as a factor influencing the extent to which peer relationships affect academic motivation, either strongly or weakly. In other words, an individual's level of academic self-efficacy can moderate how much peer relationships influence their level of academic motivation. This suggests that an individual's level of academic self-efficacy can either strengthen or weaken the correlation between peer relationships and academic motivation.

Students who have high self-confidence in academic achievement have been shown to be able to tackle challenging academic tasks and navigate school life more efficiently (Allari et al., 2020; Doménech-Betoret et al., 2017). According to a study conducted by Li, Peng, et al. (2020), it was found that students with low academic self-efficacy are more vulnerable and less motivated to complete academic tasks. This is in line with the SDT concept that refers to the understanding of competence and effectiveness in achieving goals. Competence in SDT refers to individuals' belief in their ability to achieve goals and complete specific tasks (Ryan & Deci, 2000). Students who feel competent in learning activities, such as being able to complete academic tasks well, tend to have high academic self-efficacy. Belief in their own abilities to tackle academic tasks can motivate them to actively engage in the learning process. Academic self-efficacy is used as a factor influencing how individuals evaluate and process the influence of peer relationships on their academic motivation. For example, support in working on tasks together or in dis-

cussing problem-solving in subjects provided by teachers can increase students' confidence in their ability to successfully complete academic tasks.

Although this moderation is significant, the findings of this study indicate that this moderation effect actually reduces the expected mediating impact. These findings are not in line with the research conducted by Azila-Gbettor et al. (2021), which suggests that students become more engaged in their studies if academic self-efficacy is supported by high levels of motivation. This also suggests that the mediating effect becomes weaker when academic self-efficacy levels are higher. In other words, the higher the academic self-efficacy of students, the more their academic motivation tends to increase, and vice versa. Therefore, the influence of the moderator variable leads to a decrease in the strength or significance of the mediating effect of the relationship between peer relationships and academic motivation on learning outcomes. In other words, the mediating effect of peer relationships on academic motivation is influenced by the level of academic self-efficacy of students.

## CONCLUSION

The research findings explain that there is a significant mediating effect of the relationship between peer relationships (PR) and economic learning outcomes (EO) through academic motivation (AM), as well as significant moderation of this mediating effect by academic self-efficacy (ASE), which reduces the strength of the mediating effect. And partially, peer relationships (PR) or academic motivation (AM) significantly influence learning outcomes (EO).

This analysis may be limited by the quality of the data used. The findings of this analysis may only apply to the sample used in the study and cannot be directly applied to a broader population, given the variables and different populations involved. Therefore, future research is expected to involve samples from various schools, take into account gender factors as there may be differences between female and male students, and future studies are suggested to explore and add other variables to continue improving learning outcomes. Although this analysis indicates relationships between the variables studied, it cannot infer causality. There is a possibility of other unobserved or unaccounted factors in the analysis that may influence the results.

These findings can provide insights for educational practitioners regarding the importance of paying attention to academic motivation and academic self-efficacy in improving students' learning achievement. The study highlights the importance of considering the interaction among various relevant variables in analyzing factors influencing learning outcomes. Furthermore, these research findings can also assist in designing more effective educational policies by considering the significance of academic motivation and academic self-efficacy, thereby providing better support to students in achieving optimal learning outcomes.

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