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The Relationship between Parental Involvement and Learning Motivation with Science Learning Achievement of Public Junior High School Students in Kendari City

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Abstract: This study aims to analyze the relationship between parental involvement and learning motivation with students' science (IPA) achievement in public junior high schools in Kendari City. This research employed an ex post facto design with a survey approach and correlational design. The sample consisted of 178 eighth-grade students selected using multistage proportional sampling. Data were collected through questionnaires and report card documentation, and analyzed using descriptive statistics and simple as well as multiple linear regression. The results showed that parental involvement, learning motivation, and science achievement were generally in the moderate category. There was a positive and significant relationship between parental involvement and science achievement (53.70%), as well as between learning motivation and science achievement (72.40%). Simultaneously, both variables showed a positive and significant relationship with a contribution of 72.50%, with learning motivation being the more dominant variable.

Keywords: Learning achievement; Learning motivation; Parental involvement; Science

Introduction

Education is a fundamental foundation for developing the quality of human resources and serves as a strategic investment for national progress (Zahwa et al., 2025). Through high-quality education, a generation capable of competing globally and contributing to national development can be created. Education not only functions to improve individuals' standards of living, but also acts as a means to establish a just, integrity-driven, and prosperous society (Setyawan, 2025). One indicator of educational quality can be seen in students' academic achievement (Prastawati & Mulyono, 2023). However, this ideal condition still faces serious challenges in practice, especially at the junior high school level, which represents a critical transition phase from primary to secondary education.

The low quality of education cannot be separated from various factors that influence the learning process. Students' academic achievement is affected by both internal and external factors (Adnan et al., 2022). Internal factors include personal conditions such as cognitive ability, interests, and learning motivation. Meanwhile, external factors encompass aspects outside the students themselves, including the school environment, community environment, and parental support and involvement at home. Among these factors, learning motivation and parental involvement are key elements that directly support the achievement of optimal learning outcomes.

From the perspective of external factors, parental involvement is a fundamental element that forms the foundation of children's educational success. Parental involvement in education can be described as the provision of essential family support that directly

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contributes to students' academic goals. This support, as perceived by students, reflects the role of parents as part of a supportive social network, where interactions are characterized by care, warmth, approval, and generally positive feelings. In essence, parental involvement provides strong encouragement or motivation for students, which has been proven to be a key component in improving academic achievement (Adnan et al., 2022).

Empirical studies have demonstrated the significant role of parental involvement in academic achievement. Santika & Harahap (2023) concluded that parental involvement has a positive and significant relationship with students' academic achievement, indicated by a significance value of $p = 0.000 < 0.05$ and a correlation coefficient of $r = 0.604$ (moderately strong category), contributing 36.48% to learning outcomes, while the remainder is influenced by other factors outside the study variables. This finding reinforces that parental involvement makes a substantial and indispensable contribution to students' academic success.

Optimal parental support will be more effective when accompanied by strong learning motivation within students. Learning motivation is an internal factor that plays an important role in determining the intensity and quality of students' efforts in learning. Without strong motivation, students tend to struggle to maintain focus and commitment to learning activities (Elvianasti et al., 2022; Azhar & Wahyudi, 2024; Hermiati et al., 2024). Alali & Wardat (2024) describe learning motivation as an internal drive that encourages students to exert optimal effort in learning. Mustafa (2021), in a study involving 172 eighth-grade students at SMP Negeri 4 Pekanbaru, found that learning motivation was in the moderate category with an average score of 70.49, while science learning outcomes were relatively high with an average of 83.74. The study also revealed a positive and significant relationship ($r = 0.650$; $p = 0.000 < 0.05$), with a contribution of 42.25% to the variance in learning outcomes, confirming that increased learning motivation is associated with improved academic achievement. This finding indicates that the higher the students' learning motivation, the better their academic performance.

Furthermore, when parental involvement and learning motivation work synergistically, their impact on academic achievement becomes stronger. Sadafin (2018), in a study of 100 students at SMP Negeri 1 Baubau, found that both variables simultaneously had a significant effect (sig. $0.000 < 0.05$) with a contribution of 36.5%. Partially, learning motivation was the most dominant factor ($\beta = 0.346$; sig. 0.001) compared to parental involvement ($\beta = 0.330$; sig. 0.002).

Similar findings were reported by Nurdan et al. (2024), which further strengthen the understanding of the influence of learning motivation and parental attention on student achievement. These two factors were simultaneously proven to significantly affect learning outcomes. The coefficient of determination showed a contribution of 72.7%, indicating that most of the variation in achievement can be explained by these variables, while the rest is influenced by other factors outside the study. These findings confirm that parental involvement and learning motivation are closely interrelated factors in determining students' academic success. When parents provide optimal support and students have high motivation, academic achievement increases significantly.

However, despite theoretical and empirical evidence showing a strong relationship between parental involvement, learning motivation, and academic achievement, the situation in Kendari City indicates that this synergy has not been fully realized. The importance of this synergy is also supported by global empirical findings. Xiong et al. (2021), Agapito et al. (2024), and Chen et al. (2024) found that parental involvement has a significant effect on adolescents' academic achievement, with students' engagement in school learning acting as a key mediator in this relationship.

To better understand this issue, it is important to recognize that academic achievement is the result or outcome of students' learning processes, which can be measured through various indicators such as grades, test results, and skill improvement (Musfirah et al., 2024). At the junior high school level, academic achievement not only reflects mastery of subject matter but also serves as an indicator of learning effectiveness and the attainment of educational objectives. It is measured through instruments such as daily tests, mid-semester exams (PTS), final semester exams (PAS), and the achievement of the Minimum Mastery Criteria (KKM) in accordance with the Indonesian Ministry of Education Regulation No. 23 of 2016. In science education, academic achievement plays an important role as it relates to the development of students' critical thinking, analytical skills, and scientific literacy.

In practice, however, achieving optimal academic performance faces various challenges, particularly those related to parental involvement and learning motivation. Social and economic changes have led to increased parental busyness, limiting the time available for supervising children's learning. Many parents work full-time, reducing the time and energy they can devote to participating in their children's education (Ishida & Sekiyama, 2024). Nevertheless, parental support continues to have a significant influence on learning success. This condition is further exacerbated by students' high dependence on gadgets, games, and other digital activities, which often lead them to prioritize entertainment over studying and receive less optimal

supervision from parents (Arfinal & Nabila, 2025). Additionally, students tend to be easily influenced by their surrounding environment. The impact of these conditions is twofold: weakening parental supervision and reducing learning motivation, which ultimately contributes to lower academic achievement.

Based on these conditions, preliminary observations were conducted. The results from several public junior high schools in Kendari City show variations in students' academic achievement in science subjects. Data from SMP Negeri 1, 2, 9, and 24 Kendari reveal significant differences in learning outcomes, motivation, and parental involvement. At SMP Negeri 1 Kendari, the average daily test score exceeds 80, with scores ranging from 100 to 60 and 80% of students meeting the KKM. Classroom conditions are considered good, marked by high discipline and readiness to learn. Students also demonstrate high learning motivation, as seen in their enthusiasm, diligence in completing assignments, and desire to achieve academic success. In terms of parental involvement, most parents provide adequate learning facilities, although monitoring and motivational support are still inconsistent.

At SMP Negeri 2 Kendari, the average score is 80, with a range of 95 to 40 and an 80% completion rate. Student discipline is good, but learning readiness is moderate. Learning motivation is also at a moderate level, indicated by less-than-optimal enthusiasm and effort, as well as a low desire for academic achievement. Parental involvement in monitoring, providing facilities, and offering motivation is also moderate and not yet optimal, affecting some students' ability to achieve optimal learning outcomes.

At SMP Negeri 9 Kendari, academic achievement is relatively lower, with an average score of 75, a range of 95 to 50, and a completion rate of 74%. Although student discipline and readiness are good, learning motivation ranges from moderate to low. This is reflected in some students' lack of desire to achieve higher academic performance. In addition, parental involvement in monitoring and supporting learning is inconsistent, which also affects students' learning outcomes.

Meanwhile, at SMP Negeri 24 Kendari, the average score is 85, with a range of 93 to 65 and an 85% completion rate. Students' learning readiness is good, although discipline is moderate. Learning motivation is also at a moderate level, as indicated by less-than-optimal enthusiasm and effort in learning. From the perspective of parental involvement, support remains moderate in terms of monitoring, providing facilities, and offering motivation, resulting in some students not achieving optimal learning outcomes.

These observations indicate differences in academic achievement both between schools and among students within the same school. These differences are not only related to internal factors but are also closely associated with external factors such as parental involvement, as well as internal factors such as students' learning motivation. This phenomenon suggests that intellectual ability alone is not sufficient to guarantee optimal academic achievement. Many students perceive science as a subject that relies solely on memorization, whereas in reality, it requires deep understanding, active engagement, and strong learning motivation to achieve optimal results.

Low academic achievement cannot be overlooked, as it may have detrimental effects. Students with low achievement may experience difficulties in following subsequent lessons, indicating a lack of understanding of previously taught material. Additionally, low academic achievement can lead to psychological impacts, such as decreased self-confidence and increased feelings of burden during the learning process.

Based on the above discussion, it is important to conduct an in-depth study on how parental involvement and learning motivation influence students' academic achievement in science. This study aims to provide empirical insights into the roles of these two factors in supporting optimal academic performance. Therefore, the researcher is interested in conducting a study entitled "The Relationship Between Parental Involvement and Learning Motivation with Science Learning Achievement of Public Junior High School Students in Kendari City."

Method

This study employed an ex post facto design using a survey approach. It adopted a quantitative method with a correlational research design aimed at examining the relationship between variables and determining the strength of such relationships. The study analyzed the relationship between two independent variables, namely parental involvement (X_1) and learning motivation (X_2), and one dependent variable, namely students' science learning achievement (Y), both partially and simultaneously. Data were collected through questionnaires distributed to junior high school students in public schools across Kendari City as the main instrument. This correlational survey method was chosen as it is effective for investigating relationships among variables within a relatively large population in a limited time.

Research was conducted during the second semester of the 2025/2026 academic year at public junior high schools in Kendari City. The population consisted of all students from these schools, totaling 3,320 students. The sample was determined using a multistage proportional sampling technique to ensure representativeness. The sampling process was carried

out in several stages, beginning with determining the total sample size using the Taro Yamane formula with a 0.04 margin of error, resulting in 526 samples. The sample was then focused on eighth-grade students, yielding 178 participants, as this group is considered to have relatively stable learning conditions and sufficient experience at the junior high school level. The final stage involved proportionally distributing the sample across four schools, resulting in 55 students from SMP Negeri 1 Kendari, 47 students from SMP Negeri 2 Kendari, 69 students from SMP Negeri 9 Kendari, and 7 students from SMP Negeri 24 Kendari, making a total of 178 respondents.

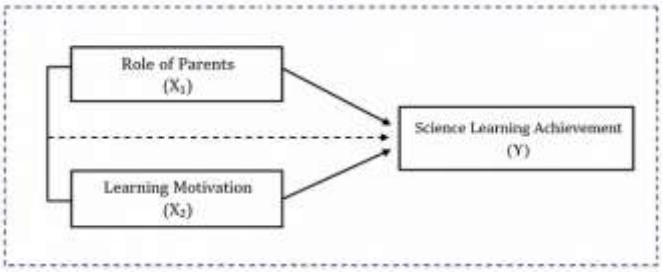

Figure 1. Research design

The variables in this study consisted of independent variables and a dependent variable. Parental involvement was defined as comprehensive participation in children's education, including guidance, motivation, supervision, and the provision of learning facilities. Learning motivation referred to internal and external drives that direct and sustain students' learning behavior, measured using the ARCS model indicators: attention, relevance, confidence, and satisfaction. Meanwhile, learning achievement was defined as the outcome of the learning process, focusing on the cognitive domain, and was measured using students' science (Biology) semester grades.

Data collection techniques involved the use of questionnaires and documentation. Questionnaires were designed based on indicators of parental involvement and learning motivation, using a Likert scale with five response options ranging from strongly agree to strongly disagree. The parental involvement instrument included indicators such as providing guidance, giving encouragement, facilitating learning needs, and supervising children, while the learning motivation instrument covered attention, relevance, confidence, and satisfaction. Learning achievement data were obtained from students' report card records. The data collection process was conducted in three stages: preparation, implementation, and completion. The preparation stage involved coordinating with schools, reviewing relevant literature, developing instruments, and conducting content validity tests. The implementation stage included distributing questionnaires, collecting responses, and gathering academic data. The completion stage involved data processing, analysis, and drawing conclusions.

Data analysis was conducted using descriptive and inferential statistical techniques with the assistance of SPSS 21.0 for Windows. Descriptive analysis was used to describe the characteristics of each variable, including minimum and maximum scores, mean, median, mode, and standard deviation. The data were also categorized into levels such as very high, high, moderate, low, and very low based on mean and standard deviation. Inferential analysis was used to test research hypotheses, preceded by prerequisite tests including normality and linearity tests. Hypothesis testing was conducted at a significance level of 0.05. Simple linear regression analysis was used to examine the partial relationship between each independent variable and the dependent variable, while multiple linear regression analysis was employed to determine the simultaneous relationship between parental involvement and learning motivation on students' science learning achievement.

Result and Discussion

The results of this study were obtained to determine the relationship between parental involvement and learning motivation with students' science learning achievement in public junior high schools across Kendari City. The collected data were analyzed using Microsoft Excel and SPSS, and then presented through descriptive and inferential statistical analyses. Descriptive analysis aims to provide a general overview of the characteristics of each research variable, while inferential analysis is used to test hypotheses regarding the relationships among variables.

Based on the results of the descriptive statistical analysis of the parental involvement variable, it was found that from 178 respondents, the minimum score was 38 and the maximum score was 116, with an average value of 85.21 and a standard deviation of 14.20. This mean value indicates that, in general, parental involvement falls into the moderate category. The relatively large standard deviation suggests considerable variation in the level of parental involvement in children's education. The wide score range also reflects a clear difference between parents with high and low levels of involvement. The category distribution shows that most parents fall into the moderate category (35%), followed by high (29%) and low (25%), while very high (7%) and very low (4%) categories have relatively small proportions. This condition indicates that parental involvement in children's education is still uneven and tends to be moderate, highlighting the need for improvement

through enhanced communication and collaboration between schools and parents.

Furthermore, the descriptive analysis of the learning motivation variable shows that from 178 respondents, the minimum score was 74 and the maximum score was 119, with an average of 93.47 and a standard deviation of 10.42. This average indicates that students' learning motivation generally falls into the moderate category. The relatively moderate variation suggests that most students possess a sufficient level of motivation, although it has not yet reached an optimal level. The category distribution reveals that most students are in the moderate category (32%), followed by high (23%), low (21%), very low (16%), and very high (8%). The proportion of students in the low and very low categories, which reaches 37%, is a significant concern, as it indicates the presence of a substantial group of students with insufficient learning motivation. This finding suggests the need for intervention through more innovative teaching strategies, teacher support, and parental involvement to enhance students' motivation.

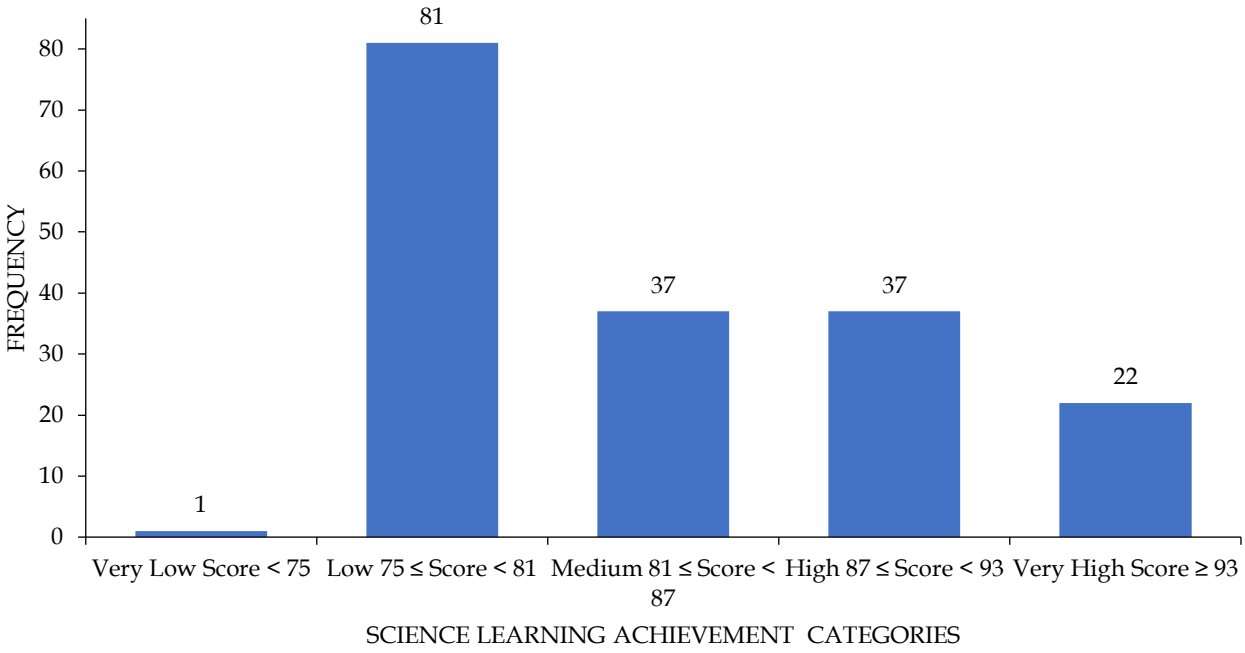

Figure 2. Frequency distribution of students' learning achievement in Public Junior High Schools across Kendari City

Meanwhile, the descriptive analysis of students' science learning achievement indicates that the minimum score obtained was 74 and the maximum score was 100, with an average of 83.97 and a standard deviation of 6.11. The mean score suggests that students' science achievement is generally in the moderate category. The relatively small standard deviation indicates that students' academic abilities tend to be homogeneous. However, the category distribution shows that most students fall into the low category (46%), followed by moderate and high categories at 21% each, very high at 12%, and very low at 1%. The dominance of the low category indicates that many students have not yet achieved optimal learning outcomes in science, thus requiring special attention to improve the quality of instruction and learning support.

The results of inferential statistical analysis indicate that there is a significant relationship between parental involvement and students' science learning achievement. This is evidenced by a significance value of 0.000 ($p < 0.05$) and an F-value of 203.860, indicating that the regression model is statistically significant. The correlation coefficient of 0.733 shows a strong relationship between the two variables, while the coefficient of determination of 53.7% indicates that more than half of the variation in science learning achievement can be explained by parental involvement. The regression equation shows that each increase in parental involvement is followed by an increase in students' science achievement. Thus, the higher the level of parental involvement in education, the higher the students' academic achievement.

In addition, the analysis results show that learning motivation has a very strong and significant relationship with science learning achievement. The significance value of 0.000 ($p < 0.05$) and a very high F-value indicate that the regression model is highly significant. The correlation coefficient of 0.851 indicates a very strong relationship, while the coefficient of determination of 72.4% shows that most of the variation in learning

achievement can be explained by learning motivation. The regression equation indicates that each increase in learning motivation significantly improves science learning achievement. This finding confirms that learning motivation is a crucial internal factor in determining students' academic success.

Furthermore, the results of multiple linear regression analysis indicate that parental involvement and learning motivation simultaneously have a positive and significant relationship with science learning achievement. This is supported by a significance value of 0.000 ($p < 0.05$) and an F-value of 230.162. The correlation coefficient of 0.851 indicates a very strong relationship between the independent variables collectively and the dependent variable. The coefficient of determination of 72.5% shows that the combination of parental involvement and learning motivation explains most of the variation in students' science achievement. However, the regression coefficient analysis reveals that learning motivation has a more dominant influence than parental involvement, as indicated by a Beta coefficient of 0.801, while parental involvement has a Beta value of only 0.059 and is not statistically significant.

Overall, the findings of this study indicate that although parental involvement plays an important role in students' academic achievement, learning motivation is the most dominant factor in determining academic success. This suggests that efforts to improve academic achievement should not rely solely on external support from parents but must also focus on strengthening students' internal motivation. Therefore, the synergy between parental involvement and efforts to enhance learning motivation through effective teaching strategies is essential in improving students' science learning achievement.

Discussion

Based on the results of the research data analysis conducted both descriptively and inferentially, the discussion in this study is intended to provide explanations of the findings based on the obtained results.

Description of Parental Involvement of Junior High School Students in Kendari City

The results of the descriptive statistical analysis of the parental involvement variable were based on data obtained from 178 respondents of public junior high school students in Kendari City. The instrument used consisted of 30 statement items with a Likert scale ranging from 1 to 4, resulting in a theoretical minimum score of 30 and a maximum score of 120. Based on empirical data, the minimum score obtained by respondents was 38 and the maximum score was 116. The mean score of 85.21 falls into the moderate category based on the predetermined interval ($78 \leq \text{score} < 92$). Meanwhile, the standard deviation value of 14.20 indicates a relatively heterogeneous data distribution, suggesting variations in the level of parental involvement in supporting students' education.

The category distribution shows that most respondents fall into the moderate category (35%), followed by the high category (29%) and the low category (25%). The very high category accounts for 7%, while the very low category represents 4%. Overall, 64% of parents fall within the moderate to high categories. This indicates that parental involvement in supporting students' education is fairly good. However, 29% of parents are still in the low and very low categories, which requires attention and strengthening from the school.

The dominance of the moderate category of parental involvement in public junior high schools in Kendari City indicates that such involvement exists but has not yet reached an optimal level. This condition may be influenced by various factors, such as parents' educational background, work commitments, residential distance, and understanding of effective forms of involvement. In the context of science learning, parental involvement may include monitoring students' study activities at home, providing learning facilities, offering emotional support, and maintaining communication with the school (Jufri et al., 2024). When this involvement remains at a moderate level, the support provided is not yet maximized, which may limit improvements in students' academic achievement.

This finding is consistent with Pinneo & Nolen (2024), who state that parents' beliefs and behaviors, both directly and indirectly, serve as a means of communicating the importance of science and fostering students' confidence in their ability to succeed in science learning. Thus, parental involvement not only functions as external support but also shapes students' attitudes, motivation, and self-confidence in the learning process.

Similarly, Benner et al. (2021) found that parents' and teachers' expectations significantly influence students' academic outcomes, both directly and through parental involvement, teacher-student relationships, and school-family communication. Furthermore, Gu et al. (2024), Vu et al. (2024), Mocho et al. (2025), and Xiao et al. (2025) through a systematic review, emphasized that parental school involvement is a multidimensional construct that includes home-based involvement, school-based involvement, and home-school communication. These aspects contribute significantly to students' academic adjustment and overall development, especially when manifested through parental expectations regarding education.

Based on these findings, it can be concluded that parental involvement in public junior high schools in

Kendari City is at a fairly good level but still needs improvement to reach optimal conditions. Therefore, continuous efforts are needed to strengthen collaboration between schools and parents, particularly in enhancing communication and involvement in the learning process. Increased parental involvement is expected to create a more conducive learning environment that supports improved student achievement.

Description of Students' Learning Motivation in Public Junior High Schools in Kendari City

The descriptive statistical analysis of the learning motivation variable was based on data obtained from 178 respondents. The instrument consisted of 30 statement items with a Likert scale of 1–4, resulting in a theoretical minimum score of 30 and a maximum of 120. The empirical data showed a minimum score of 74 and a maximum score of 119. The mean score of 93.47 falls into the moderate category. The standard deviation of 10.42, along with a fairly wide score range, indicates noticeable variation in students' motivation levels.

The largest distribution is found in the moderate category (32%), followed by the low category (21%). When combined with the very low category (16%), a total of 37% of students fall into less optimal motivation levels. Meanwhile, 55% of students are in the moderate to high categories, indicating that more than half of the respondents have sufficient learning motivation, although it has not yet reached a uniformly high level.

This finding aligns with Pardede et al. (2022), who found that students' learning motivation in junior high school generally falls into the moderate category. Similar findings were reported by Satrianti et al. (2024), indicating that science learning motivation at the junior high level is not consistently high and is influenced by school context and students' cultural backgrounds.

The variation in motivation is also evident from the distribution of scores. Students in the very high category (8%) tend to have clear learning goals, good study habits, and supportive environments. Conversely, 16% of students in the very low category may experience motivational barriers influenced by both intrinsic and extrinsic factors. This is consistent with Rubiana & Dadi (2020), who emphasize that science learning motivation is influenced by both internal and external factors. The dominance of moderate motivation levels is a critical issue in science education. Sabanal et al. (2023), Sembiring et al. (2025), and Sofyan et al. (2025) highlight that moderate motivation is associated with low engagement in scientific exploration and lack of confidence in solving analytical problems. Therefore, instructional improvements are necessary to enhance student motivation through more active and exploratory learning approaches.

Description of Science Learning Achievement of Junior High School Students in Kendari City

The results of the descriptive statistical analysis of the science learning achievement variable were based on data obtained from 178 junior high school students in Kendari City. Based on the collected data, the minimum empirical score obtained by the respondents was 74 and the maximum empirical score was 100. The mean score of science learning achievement was 83.97. The standard deviation value of 6.11 indicates that the variation in students' academic abilities is relatively homogeneous, meaning that the disparity in achievement among individuals is not very pronounced.

However, the categorical distribution reveals a fairly significant academic issue. Cumulatively, 33% of students fall into the very high (12%) and high (21%) categories. Nevertheless, the largest proportion is found in the low category, accounting for 46%, with an additional 1% in the very low category. Meanwhile, 21% of students are in the moderate category. These findings indicate that the class average score, which appears relatively good (83.97), does not fully reflect an even distribution of science concept mastery at the individual level.

The dominance of students in the low achievement category (46%) is consistent with the findings of Akbar et al. (2020), who studied 80 junior high school students. Their study showed that science learning that is less applicable and lacks student involvement in contextual problem-solving tends to result in stagnant learning outcomes. The results demonstrated that students who received intervention through the Science-Technology-Society (STS) learning approach experienced an average increase in science achievement of 25.55 points, which is higher than the 18.25-point increase observed in classes using conventional methods. This suggests that the high proportion of students in Kendari City within the low category may be influenced by the lack of implementation of learning models that connect science material with real-life phenomena, which theoretically can enhance academic achievement.

Science learning achievement is also closely related to students' motivation and affective engagement during the learning process. This is supported by a study conducted by Nuraysha et al. (2024) on junior high school students, which found that a learning motivation level with an average score of 3.52 out of 4 is linearly related to students' scientific literacy and academic achievement. Globally, this finding is reinforced by Katsantonis et al. (2023), who analyzed science achievement data from 5,532 students across 211 secondary schools. The study revealed that intrinsic motivation is the strongest predictor mediating the relationship between teacher feedback and science achievement. Thus, the presence of 12% of Kendari

students in the very high category is likely influenced by well-developed self-efficacy and intrinsic motivation. Conversely, the 46% of students in the low category still require external support, including parental involvement and innovative teaching strategies.

From the perspective of practical approaches through science process skills, the uneven distribution of achievement in the higher categories also indicates the need for changes in classroom learning practices. An international study by Chai et al. (2021) emphasized that deep epistemic engagement significantly impacts science achievement across countries with advanced secondary education systems. This aligns with the findings of Kibga et al. (2021), who concluded that consistent implementation of hands-on science learning activities fosters students' curiosity, improves long-term memory retention, and enhances cognitive understanding. The condition of the majority of students in Kendari City still being in the low category suggests the need to reduce the dominance of theoretical instruction and increase the use of experimental or hands-on activities in laboratories.

Therefore, improvements in science learning strategies in junior high schools across Kendari City are necessary. The high proportion of students in the low category (46%) indicates that the current instructional practices have not been able to optimize learning outcomes. In addition, strengthening students' intrinsic motivation and enhancing collaboration between teachers and parents are essential factors in supporting more equitable improvement in science learning achievement.

The Relationship between Parental Involvement and Science Learning Achievement of Junior High School Students in Kendari City

Based on the results of simple regression analysis, it was found that there is a positive and significant effect of parental involvement on science learning achievement among junior high school students in Kendari City, with a significance value of ($p < 0.05$). This is further supported by a correlation coefficient (R) of 0.733. Thus, parental involvement contributes 53.7% to the variation in science learning achievement, while the remaining 46.3% is influenced by other factors outside parental involvement. This contribution indicates that parental involvement is an important predictor of science achievement, although it is not the sole determining factor.

Partially, based on the coefficient table, the regression coefficient for parental involvement (X_1) is 0.316, with a constant value of 57.081 and a significance value of 0.000, indicating that X_1 has a positive and significant effect on Y. The regression equation obtained is $\hat{Y} = 57.081 + 0.316X_1$, meaning that each one-unit increase in parental involvement will increase students' science achievement by 0.316 units at a constant of 57.081. The F-test result shows an F-value of 203.860 with a significance of 0.000 ($p < 0.05$), indicating that the regression model is significant. The t-test result ($t = 14.278$; sig. $0.000 < 0.05$) further confirms that H_0 is rejected and H_1 is accepted, meaning that parental involvement has a positive and significant effect on science learning achievement.

These findings indicate that parental involvement is an important external factor in supporting students' academic success. Parents act as the first educational environment that shapes children's learning habits at home. This involvement can be reflected through supervision of learning activities, emotional support, provision of learning facilities, and continuous communication with the school. Consistent parental support can create a conducive learning environment, helping students improve their motivation and learning discipline, which ultimately impacts their science achievement.

The Relationship between Learning Motivation and Science Learning Achievement of Junior High School Students in Kendari City

Based on the results of simple regression analysis, it was found that there is a positive and significant effect of learning motivation on science learning achievement, with a significance value of ($p < 0.05$). This is also supported by a correlation coefficient (R) of 0.851, indicating a very strong relationship between the two variables. Thus, learning motivation contributes 72.4% to the variation in science achievement, while the remaining 27.6% is influenced by other factors. This indicates that learning motivation is a very important predictor of science achievement.

The regression equation obtained is $\hat{Y} = 37.303 + 0.499X_2$, meaning that each one-unit increase in learning motivation increases science achievement by 0.499 units. Statistical tests confirm that this relationship is highly significant.

These findings suggest that motivation plays a central role in encouraging students to be more persistent, active in seeking learning resources, and capable of understanding concepts deeply. Students with low motivation tend to be passive, leading to lower academic achievement.

The Simultaneous Relationship between Parental Involvement and Learning Motivation on Science Learning Achievement

The results of multiple linear regression analysis indicate that parental involvement and learning motivation simultaneously have a positive and significant effect on science learning achievement ($p <$

0.05), with a correlation coefficient (R) of 0.851. Together, these variables contribute 72.5% to the variation in science achievement.

However, partially, parental involvement does not show a significant effect, while learning motivation remains significant and dominant. This indicates that motivation is the more direct factor influencing students' academic performance, while parental involvement may operate indirectly through shaping study habits and discipline.

Interestingly, some students with low parental involvement still achieve high academic performance due to strong motivation, while others with high parental support but low motivation achieve only moderate results. This pattern reinforces the conclusion that learning motivation is the most dominant factor.

Pedagogically, these findings imply that improving science achievement requires both enhancing students' motivation through innovative teaching strategies (such as problem-based learning, inquiry learning, and project-based learning) and strengthening collaboration between schools and parents. Such synergy is essential for achieving optimal and sustainable improvement in students' science learning achievement.

Conclusion

This study concludes that both parental involvement and learning motivation have positive and significant relationships with students' science learning achievement in public junior high schools in Kendari City, both partially and simultaneously. However, learning motivation emerges as the most dominant factor influencing academic achievement. Descriptively, parental involvement and students' learning motivation are generally at a moderate level, while science learning achievement, although showing a relatively good average score, is still dominated by students in the low achievement category. This indicates that the overall academic performance has not been evenly distributed at the individual level. Inferential analysis reveals that parental involvement contributes significantly to students' science achievement, accounting for 53.7% of the variance, indicating that family support plays an important role in shaping students' learning outcomes. Meanwhile, learning motivation shows a stronger contribution of 72.4%, confirming that internal factors are more directly related to students' academic success. When analyzed simultaneously, both variables contribute 72.5% to the variation in achievement, but learning motivation remains the dominant predictor, while parental involvement does not show a significant effect when combined with motivation. These findings suggest that although parental involvement is important as an external support system, students' internal motivation is the key determinant of academic success. Motivation drives students to actively engage in learning, persist in facing challenges, and achieve better academic outcomes. On the other hand, parental involvement tends to function indirectly by shaping learning habits, discipline, and providing a supportive learning environment. Therefore, improving students' science learning achievement requires a balanced approach that strengthens both internal and external factors. Schools and teachers need to implement innovative and engaging learning strategies to enhance students' motivation, while also fostering effective collaboration with parents to create a supportive learning environment at home. The synergy between strong learning motivation and optimal parental involvement is essential to achieving improved and sustainable academic outcomes.

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Author Contributions
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The authors declare no conflict of interest.

References

Adnan, K., Amin, M., & Niar, F. (2022). Dukungan Orang Tua dalam Prestasi Belajar Siswa Kelas Tinggi. *Jurnal Pendidikan & Pembelajaran Sekolah Dasar*, *2*(2), 228–234. Retrieved from https://ojs.unm.ac.id/jppsd/index

Agapito, A. K. B., Bugarin, M. J. V., Fuñe, E. G., & Alba, R. (2024). Investigating the Influence of Parental Engagement on Academic Achievement of Junior High School Students in Science. *RULE-SJCO Journal*, *3*(2). https://doi.org/10.5281/zenodo.16899391

Akbar, J. H., Muhlis, M., Hadiprayitno, G., & Artayasa, I. P. (2020). Perbedaan Prestasi Belajar IPA Menggunakan Model Pembelajaran Sains Teknologi Masyarakat (STM) dengan Model Problem Based Learning (PBL) di SMPN 7 Mataram. *Jurnal Ilmiah Profesi Pendidikan*, *9*(2), 1016–1022. https://doi.org/10.29303/jipp.v9i2.2220

Alali, R., & Wardat, Y. (2024). Enhancing Student Motivation and Achievement in Science Classrooms Through STEM Education. *STEM Education*, *4*(3), 183–198. https://doi.org/10.3934/steme.2024012

Arfinal, M., & Nabila, N. (2025). Peran Orang Tua di Dalam Usaha Meningkatkan Prestasi Belajar Anak. *Jurnal Intelek Insan Cendikia*, *2*(4), 6483–6488. Retrieved from https://jicnusantara.com/index.php/jiic/article/view/2969

Azhar, M., & Wahyudi, H. (2024). Motivasi Belajar: Kunci Pengembangan Karakter dan Keterampilan Siswa. *Uluwwul Himmah Education Research Journal*, *1*(1), 1–15. Retrieved from https://www.researchgate.net/publication/381509139_Motivasi_Belajar_Kunci_Pengembangan_Karakter_dan_Keterampilan_Siswa

Benner, A. D., Fernandez, C. C., Hou, Y., & Gonzalez, C. S. (2021). Parent and Teacher Educational Expectations and Adolescents' Academic Performance: Mechanisms of Influence. *Journal of Community Psychology*. https://doi.org/10.1002/jcop.22644

Chen, F., Wang, J., Zhang, W., Li, P., Zeng, Y., & Zou, H. (2024). The Relationship between Parental Educational Involvement and Learning Engagement Among Chinese Middle School Students: The Mediating Effect of Gratitude and Hope. *Behavioral Sciences*, *14*(8), 687. https://doi.org/10.3390/bs14080687

Chai, C. S., Lin, P. Y., King, R. B., & Jong, M. S. Y. (2021). Intrinsic Motivation and Sophisticated Epistemic Beliefs are Promising Pathways to Science Achievement. *Frontiers in Psychology*, *12*, 581193. https://doi.org/10.3389/fpsyg.2021.581193

Elvianasti, M., Lufri., Andromeda, A., Mufit, F., Pramudiani, P., & Safahi, L. (2022). Motivasi dan Hasil Belajar Siswa IPA: Studi Metaanalisis. *Edukasi: Jurnal Pendidikan*, *20*(1), 73-84. Retrieved from http://repository.uhamka.ac.id/id/eprint/22931/

Gu, X., Hassan, N. C., & Sulaiman, T. (2024). The Relationship between Family Factors and Academic Achievement of Junior High School Students in Rural China: Mediation Effect of Parental Involvement. *Behavioral Sciences*, *14*(3), 221. https://doi.org/10.3390/bs14030221

Hermiati, D., Pranata, O. D., & Lardiman, H. (2024). Motivasi Belajar Siswa pada Pembelajaran Sains: Studi Komparasi pada Tiga Sekolah. *PENDIPA Journal of Science Education*, *8*(1), 17–26. https://doi.org/10.33369/pendipa.8.1.17-26

Ishida, A., & Sekiyama, T. (2024). Variables Influencing Students' Learning Motivation: Critical Literature Review. *Frontiers in Education*, *9*, 1445011. https://doi.org/10.3389/feduc.2024.1445011

Jufri, M., Bahri, A., & Palennari, M. (2024). Pengaruh Kecerdasan Emosional, Efikasi Diri, dan Motivasi Belajar terhadap Hasil Belajar Biologi Siswa SMAN 8 Pangkep. *UNM Journal of Biological Education*, *7*(2), 52-60. https://doi.org/10.35580/ujbe.v7i2.62969

Katsantonis, I., McLellan, R., & Torres, P. E. (2023). Associations between Science Achievement, Motivation, and Teachers' Feedback. *Frontiers in Psychology*, *14*, 1124189. https://doi.org/10.3389/fpsyg.2023.1124189

Kibga, E. Y., Ndunguru, P. A., & Mkonongwa, L. M. (2021). Effectiveness of Hands-on Activities in Science Learning. *Turkish Journal of Science Education*, *18*(4), 618–638. https://doi.org/10.36681/tused.2021.93

Mocho, H., Catia, M., Rita, D. S., Elias, R., & Cristina, N. (2025). Measuring Parental School Involvement: A Systematic Review. *European Journal of Investigation in Health, Psychology and Education*, *15*(6), 96. https://doi.org/10.3390/ejihpe15060096

Musfirah, M., Halik, A., Syarif, N. Q., & Iyan, I. (2024). Pengaruh Motivasi Belajar Terhadap Prestasi Belajar Siswa. *Proceedings of National Seminar*, 692–706. Retrieved from https://ojs.unm.ac.id/semnaslemlit/article/view/67176

Mustafa, M. (2021). *Hubungan antara Motivasi Belajar dengan Hasil Belajar IPA Siswa Kelas VIII SMP Negeri 4 Pekanbaru* (Undergraduate Thesis). Universitas Islam Riau. Retrieved from https://repository.uir.ac.id/11524/1/156511244.pdf

Nuraysha, A. D., Winarno, N., Fadly, W., Hakim, L., & Emiliannur, E. (2024). Analyzing Students' Motivation Towards Science Learning. *Jurnal Penelitian Pendidikan IPA*, *10*(7), 4139–4148. https://doi.org/10.29303/jppipa.v10i7.7297

Nurdan, N., Iskandar, I., & Herlina, H. (2024). Pengaruh Motivasi Belajar dan Perhatian Orang Tua Terhadap Prestasi Belajar Siswa. *Jurnal Studi Guru dan Pembelajaran*, *7*(1), 369–379. https://doi.org/10.30605/jsgp.7.1.2024.3765

Pardede, H., Turnip, A. T., Manalu, A., Nagur, M. D., & Nababan, T. (2022). Analisis Motivasi Belajar Siswa pada Pelajaran IPA. *Equilibrium: Jurnal Pendidikan*, *10*(3), 436–444. https://doi.org/10.26618/equilibrium.v10i3.8920

Pinneo, L., & Nolen, A. (2024). Parent Involvement and Student Academic Motivation. *Humanities and Social Sciences Communications*, *11*(1), Article 234. https://doi.org/10.1057/s41599-024-02707-0

Prastawati, T. T., & Mulyono, R. (2023). Peran Manajemen Pembelajaran dalam Meningkatkan Prestasi Belajar Siswa. *Didaktik: Jurnal Ilmiah PGSD*,

9(1), 378–392. https://doi.org/10.36989/didaktik.v9i1.709

Rubiana, E. P., & Dadi, D. (2020). Faktor-Faktor yang Mempengaruhi Motivasi Belajar IPA Siswa SMP. *Bioed: Jurnal Pendidikan Biologi*, *8*(2), 12–18. https://doi.org/10.25157/jpb.v8i2.4376

Sabanal, G. J. A., Reputana, K. G. D., Palwa, S. S., Labandero, C. L. H., & Alimbon, J. A. (2023). Motivation and Academic Performance of Secondary Students in Science: A Correlational Study. *Asian Journal of Science Education*, *5*(2), 20-29. https://doi.org/10.24815/ajse.v5i2.31668

Sadafin, S. (2018). Pengaruh Motivasi Belajar dan Peran Serta Orang Tua Terhadap Prestasi Belajar Siswa. *Sang Pencerah*, *4*(1), 48–57. https://doi.org/10.35326/pencerah.v4i1.289

Santika, S., & Harahap, H. S. (2023). Hubungan Keterlibatan Orang Tua dengan Prestasi Belajar Siswa. *BIOEDUSAINS*, *6*(2), 507. https://doi.org/10.31539/bioedusains.v6i2.7618

Satrianti, E., Pranata, O. D., & Tiara, T. (2024). Science Learning Motivation Among Students. *Jurnal Pijar MIPA*, *19*(1), 20–26. https://doi.org/10.29303/jpm.v19i1.6101

Sembiring, S. S. B., Erlina, N., & Selamet, K. (2025). Analysis of Science Learning Motivation. *JPPIPA*, *10*(2), 141–146. https://doi.org/10.26740/jppipa.v10n2.p141-146

Setyawan, D. (2025). Membangun Generasi Emas: Peran Pendidikan dalam Membentuk Masa Depan Bangsa. *Jurnal Pembelajaran, Kurikulum dan Teknologi Pendidikan*, *1*(1), 1–9. Retrieved from https://artmediapub.id/index.php/JPKTP/article/view/66

Sofyan, A., Fadli, M., Kulimbang, E., Hasan, H., & Warti, E. (2025). The Relationship between Learning Motivation and Academic Achievement of High School Students. *Gateway for Understanding Research in Education*, *1*(2), 30-41. https://doi.org/10.69855/guru.v1i2.337

Vu, T. V., Scharmer, A. L., Triest, E. V., Atteveldt, N. V., & Meeter, M. (2024). The Reciprocity between Various Motivation Constructs and Academic Achievement: A Systematic Review and Multilevel Meta-Analysis of Longitudinal Studies. *Educational Psychology*, *44*(2), 136-170. https://doi.org/10.1080/01443410.2024.2307960

Xiao, M., Zuo, M., Liu, X., Wang, K., & Luo, H. (2025). After-School Behaviors, Self-Management, and Parental Involvement as Predictors of Academic Achievement in Adolescents. *Behavioral Sciences*, *15*(2), 172. https://doi.org/10.3390/bs15020172

Xiong, Y., Qin, X., Wang, Q., & Ren, P. (2021). Parental Involvement and Academic Achievement. *Journal of Youth and Adolescence*, *50*, 1811–1823. https://doi.org/10.1007/s10964-021-01460-w

Zahwa, A., Safitri, R. D., Pratiwi, A. N. R., & Subiakto, V. S. N. (2025). Peran Strategis Investasi Pendidikan. *Indonesian Journal of Education*, *2*(1), 150–155. https://doi.org/10.71417/ije.v2i1.392