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The Relationship between Discipline and Learning Motivation and the Science Learning Achievement of State Junior High School Students in Luwu Regency

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Abstract: This study analyzes the levels of discipline, learning motivation, and science achievement among state junior high school students in Luwu Regency, as well as their relationships both partially and simultaneously. The research uses a quantitative non-experimental design with a correlational survey approach, involving 125 students selected through proportional random sampling. Data were collected using Likert-scale questionnaires and documentation, then analyzed with descriptive statistics and linear regression. The results show that discipline (79.89), learning motivation (148.38), and science achievement (75.62) are all in the moderate category. Inferential analysis indicates that discipline has a positive and significant effect on science achievement (57.20%), while learning motivation has a stronger contribution (72.70%). Simultaneously, both variables contribute 78.50% to science achievement. In conclusion, discipline and learning motivation significantly influence science learning outcomes. Improving both in a balanced and integrated way is essential to achieve optimal student performance.

Keywords: Discipline; Learning motivation; Science learning achievement

Introduction

Education serves as the primary foundation in preparing high-quality human resources toward the vision of Indonesia Emas 2045. In the era of Society 5.0 currently faced by the education sector, the demands placed on students' competencies are no longer limited to rote memorization, but extend to critical reasoning, problem-solving abilities, and strong scientific literacy (Mujriati et al., 2025; Reski et al., 2025). Law Number 20 of 2003 on the National Education System emphasizes that the function of education includes not only the development of individual capacities but also the formation of character and a civilized nation, as an effort to realize an intelligent society. However, empirical conditions in the field indicate that the quality of education in Indonesia, particularly at the junior secondary school (SMP) level, continues to face complex challenges (Simamora et al., 2020; Wahyuni, 2024).

Student learning achievement is not the result of a single variable, but rather the outcome of a series of highly complex psychological and instructional processes within the educational environment (Bardach & Klassen, 2021). The problems encountered are also multidimensional, ranging from weak basic competencies among students to disparities in the national education quality (Yudianto et al., 2025). As an evaluative reflection, PISA scores can be utilized to assess and improve the quality of education. Therefore, the implementation of an integrated strategic approach becomes crucial in efforts to fundamentally and sustainably enhance educational quality (Hidi & Renninger, 2006; Martin & Marsh, 2020).

In 2022, Indonesia's PISA scores experienced a significant decline. The reading literacy score was recorded at 359, compared to 402 in 2009. In the domain of mathematical literacy, Indonesia scored 366 in 2022, marking the lowest achievement since 2006. Meanwhile,

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in scientific literacy, Indonesia obtained a score of 383, which indicates a relatively stable trend compared to previous periods (PISA, 2022). Despite the decline in scores, Indonesia's PISA ranking improved by 5–6 positions compared to the previous cycle. The low level of scientific literacy has become a major concern, especially considering that the PISA 2025 framework emphasizes more adaptive scientific competencies in relation to environmental and sustainability issues (Mujriati et al., 2025; Parisu et al., 2025). This condition reflects a gap between global curriculum demands and students' academic achievement in science at the national level.

The 2023 Education Report Card of Luwu Regency remains in the "yellow" category, indicating a moderate level of performance. The Head of the Luwu Regency Education Office, Andi Palanggi, S.STP, stated that "the current education report card of Luwu Regency stands at 64.3 on the Minimum Service Standard (SPM) index, approaching the red category or the lowest level, with weak literacy and numeracy." Therefore, appropriate measures are needed to improve the education report card to a safer or "green" level. In response, the Luwu Regency Education Office has undertaken various efforts, including organizing workshops to enhance teachers' competencies in report-based learning and conducting deep learning training for teachers and school principals across the region.

Learning achievement can be understood as the outcome of evaluating learning efforts, reflecting the results achieved by students within a specific period. Djamarah (2012) states that academic achievement represents an evaluation of students' development, as reflected in the knowledge and skills they have mastered. Furthermore, Ramadhani et al. (2024) assert that learning achievement can be attained when students possess internal drive and enthusiasm to engage in learning activities and strive for optimal results. Students who demonstrate enthusiasm and active involvement in the learning process are those who have learning motivation (Schunk & DiBenedetto, 2020; Ryan & Deci, 2020).

The decline in learning achievement is influenced by both external (environmental) and internal (personal) factors, with the primary causes often rooted in students' internal conditions (Simamora et al., 2020). Within the national strategy of the Merdeka Curriculum, the government and educational institutions utilize two key internal factors as benchmarks to address learning loss following the pandemic (Engzell et al., 2021).

The first internal factor is basic cognitive competence (literacy and numeracy). Education Report Card data show a significant gap in students' basic reading and numeracy skills. If this factor is not addressed during 2024–2025, students may experience cumulative difficulties at higher levels of education (PISA, 2022). The second internal factor is non-cognitive readiness (psychological and emotional well-being), which serves as a foundation for effective academic learning (Duckworth et al., 2019). During 2024–2025, recovery efforts are no longer solely focused on covering academic content, but also on restoring students' mental readiness affected by pandemic isolation. Many students continue to experience decreased motivation and weakened discipline as a result of prolonged distance learning (Engzell et al., 2021; Nofiazein, 2021).

Discipline in education generally encompasses three main dimensions: time discipline, behavioral discipline, and learning discipline. In the learning process, discipline reflects a mental attitude and behavior characterized by orderliness, compliance, and adherence to values, norms, and rules applied during learning activities (Tandaju et al., 2023). Similarly, Simamora et al. (2020) emphasize that discipline is a prerequisite for students to achieve better academic development in formal education, at home, and within literacy environments. Creswell & Creswell (2017) define learning discipline as an individual's adherence to rules based on internal awareness.

Students who possess awareness, internal drive, and enthusiasm to participate in learning activities are considered to have learning motivation. Academic motivation plays a crucial role in fostering enthusiasm and interest in the learning process (Ryan & Deci, 2020). Thus, it serves as a key factor supporting students' academic success. This is consistent with findings by Dermawan et al. (2025), which indicate that motivated students tend to engage more seriously in learning and strive for optimal achievement. Other studies also reveal a significant influence of academic motivation on student engagement and achievement (Siregar, 2023). Conversely, students with low motivation are more likely to experience boredom during learning. Student engagement reflects learning motivation, as seen in behaviors such as paying attention to teachers, taking notes, asking questions, expressing opinions, and diligently completing assignments (Hidi & Renninger, 2006).

Learning motivation and discipline serve as fundamental pillars in shaping consistent and sustainable academic behavior. Both enable students to carry out learning activities in an organized, directed, and responsible manner (Schunk & DiBenedetto, 2020). Discipline helps students build positive habits such as adhering to classroom rules, submitting assignments on time, being punctual, and maintaining focus during lessons. Meanwhile, motivation provides internal encouragement for students to persist, participate, and remain resilient despite challenges. When both aspects are strong, students demonstrate consistent learning

behaviors, resulting in more effective learning processes and improved academic achievement (Duckworth et al., 2019).

In science learning, which requires understanding abstract concepts and logical reasoning, intrinsic motivation is particularly essential. Students with low motivation tend to be passive, easily give up when facing difficult problems, and perceive science as a difficult subject (Hidi & Renninger, 2006). In contrast, highly motivated students exhibit persistence and enthusiasm, which positively correlate with their academic achievement (Patmawati, 2025).

Observations conducted in public junior high schools in Luwu Regency reveal several issues related to student discipline, including dress code compliance, punctuality, and engagement in the learning process, which remain relatively low. Many students arrive late to school, resulting in delayed entry into classrooms. Researchers also observed students spending time at nearby stalls during learning hours or school activities such as group exercise, cleaning activities, and religious sessions. Additionally, students were found wearing uniforms improperly, using hats during lessons, and even wearing sandals within the school environment. In the researcher's role as a science teacher and homeroom teacher, continuous coordination has been carried out with counseling teachers, homeroom teachers, and parents regarding students' discipline in submitting assignments. Many students have accumulated unfinished tasks, which has negatively impacted their academic achievement.

Interviews with the school counselor (BK teacher) at SMP Negeri 1 Belopa, Mrs. Uli, revealed that an increasing number of students arrive late to class, fail to complete assignments, lack focus, and are less active during lessons. Based on counseling results, several students admitted feeling bored, unmotivated, and struggling with time management due to habits formed during previous distance learning, as well as environmental and social media influences. Such unstructured learning environments are highly prone to triggering academic procrastination, where students continuously delay completing tasks (Svartdal et al., 2020).

Some students also exhibit social anxiety, making them reluctant to participate in discussions or ask questions. From the counselor's perspective, these issues are not limited to academic aspects but also relate to emotional conditions and underdeveloped self-management skills. Consequently, academic interventions such as additional assignments or remedial programs are often ineffective, as the root problems lie in decreased internal motivation and discipline (Engzell et al., 2021).

Based on the complexity of the identified problems, this study highlights the urgency of examining "the relationship between discipline and learning motivation with science learning achievement among public junior high school students in Luwu Regency." This study aims to provide a more comprehensive understanding of the role of each variable in influencing science academic achievement, as well as to map the patterns of relationships among these variables. The findings are expected to serve as an empirical foundation for designing more targeted educational intervention strategies to improve the quality of learning processes at the junior secondary school level.

Method

This study employed a quantitative non-experimental design using a correlational survey approach. It is categorized as a survey study because the data were collected from a sample representing the population through questionnaires to describe the condition of the variables under investigation. Furthermore, this study is correlational in nature as it aims to examine the relationships between two or more variables, specifically learning discipline and learning motivation toward students' science academic achievement in public junior high schools in Luwu Regency.

The study was conducted in Luwu Regency, Indonesia, over a period of six (6) months. This duration includes preparation, data collection, analysis, and reporting stages. The population of this study consisted of all students enrolled in public junior high schools (SMP Negeri) in Luwu Regency during the 2025/2026 academic year. Three schools were selected to represent variations in students' discipline, learning motivation, and science achievement, with a total population of 1,506 students. The sampling technique used was proportional random sampling with specific considerations. The study focused on eighth-grade (Grade VIII) students because they are in the early adolescence stage (13–14 years old), where discipline and learning motivation are developing significantly. Additionally, Grade VIII students have had sufficient experience in science learning, making their academic achievement more stable compared to Grade VII, and they are not yet burdened with final examinations like Grade IX, allowing for more natural behavioral observation. The selection of schools was based on variations in student characteristics, representation of different school sizes, and the willingness of schools to participate. Meanwhile, class selection was based on heterogeneity and representativeness of student abilities.

The sample size was determined using the Slovin formula, resulting in a total sample of 316 students. However, since this study specifically focused on Grade VIII students, the final sample consisted of 125 students distributed proportionally across three schools, namely SMP Negeri 1 Suli (27 students), SMP Negeri 1 Belopa (66 students), and SMP Negeri 3 Bua Ponrang (32 students). This sample size is considered representative and meets the requirements for inferential statistical analysis.

This study involved two independent variables and one dependent variable. The independent variables consisted of learning discipline (X_1) and learning motivation (X_2), while the dependent variable was students' science academic achievement (Y). The research design examined both partial relationships between each independent variable and the dependent variable, as well as the simultaneous relationship of both independent variables with the dependent variable.

The data were analyzed using both descriptive and inferential statistics. Descriptive analysis was conducted to summarize and describe the data, including measures such as mean, median, mode, standard deviation, frequency distribution, percentages, and data visualization in the form of tables and histograms. Inferential analysis was used to test the research hypotheses. Simple linear regression analysis was applied to examine the effect of learning discipline and learning motivation separately on students' achievement. Furthermore, multiple linear regression analysis was used to analyze the simultaneous effect of both independent variables on science academic achievement, determine the contribution of each variable, measure the strength of relationships, and develop a predictive model of students' learning achievement.

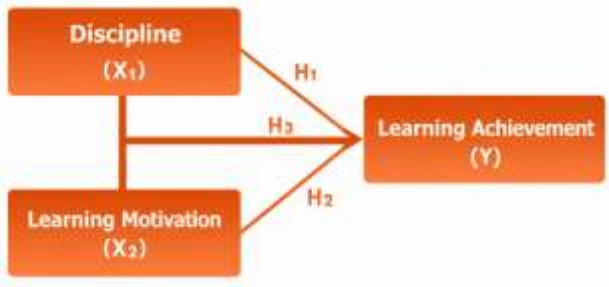

Figure 1. Research design

Result and Discussion

Results

The descriptive statistical analysis of students' learning discipline in public junior high schools in Luwu Regency indicates that the variable demonstrates a relatively stable distribution, as reflected in the mean score of 79.89, which is close to both the median (81.00) and the mode (82.00), suggesting that the overall data tend to cluster around the central values, while the standard deviation of 4.79 implies low variability among students; additionally, the scores range from a minimum of 63.00 to a maximum of 88.00, resulting in a range of 25 points, and the frequency distribution further reveals that out of 125 students, 8 students (6.40%) fall into the very low category, 22 students (17.60%) are in the low category, 40 students (32.00%) are in the medium category, 50 students (40.00%) are in the high category, and 5 students (4.00%) are in the very high category, indicating that the majority of students exhibit moderate to high levels of learning discipline, with the largest proportion concentrated in the high category.

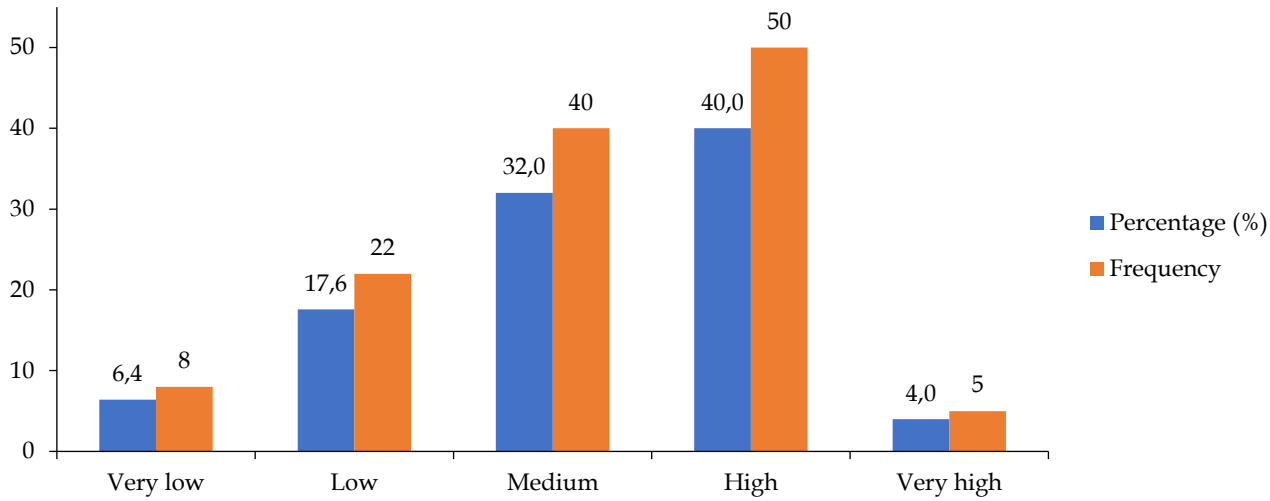

Figure 2. Histogram of frequency distribution of the learning discipline variable of Public Junior High School students in Luwu Regency

Similarly, the descriptive analysis of students' learning motivation shows that the mean score is 148.38, which is slightly higher than the median of 144.00 and the mode of 143.00, suggesting that students' motivation levels tend to be relatively strong, although with a standard deviation of 12.62 indicating moderate variability across respondents; the scores range from 120 to 195, producing a range of 75 points, and the distribution shows that 3 students (2.40%) fall into the very low category, 28 students (22.40%) into the low category, 53 students (42.40%) into the medium category, 32 students (25.60%) into the high category, and 9 students (7.20%) into the very high category, which implies that, in general, students' learning motivation tends to be concentrated in the moderate category, although a considerable proportion also demonstrates high motivation levels.

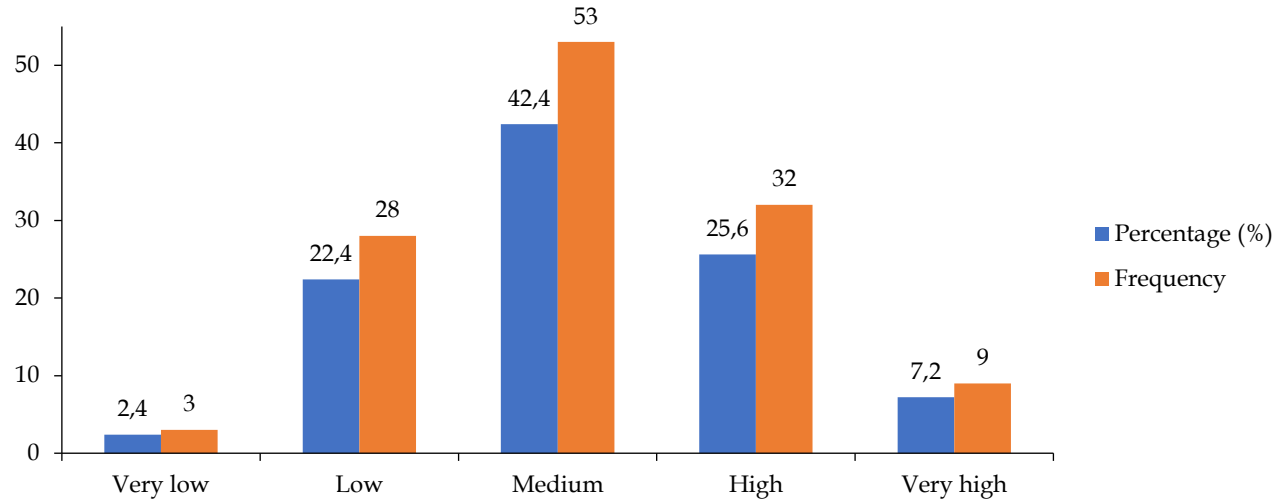

Figure 3. Histogram of frequency distribution of the learning motivation variable of Public Junior High School students in Luwu Regency

Furthermore, the descriptive statistical analysis of students' science learning achievement reveals a mean score of 75.62, which is slightly higher than the median of 75.50 and the mode of 68.50, indicating a relatively balanced distribution of achievement scores, while the standard deviation of 7.49 suggests moderate variability among students' performance; the scores range from a minimum of 62 to a maximum of 91, resulting in a range of 29 points, and the frequency distribution indicates that 6 students (4.80%) fall into the very low category, 44 students (35.20%) into the low category, 22 students (17.60%) into the medium category, 37 students (29.60%) into the high category, and 16 students (12.80%) into the very high category, demonstrating that, overall, students' science achievement tends to fall within the moderate category, although a relatively large proportion still remains in the low category.

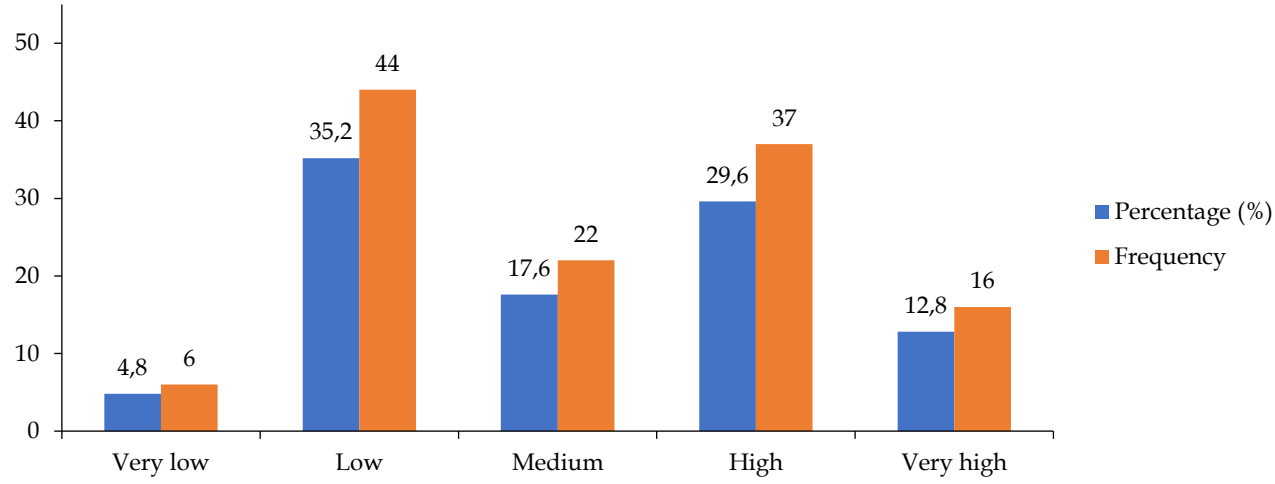

Figure 4. Histogram of frequency distribution of the learning achievement variable of Public Junior High School students in Suli District

In terms of inferential analysis, the relationship between learning discipline and science achievement shows a correlation coefficient of r = 0.756 and a coefficient of determination of 0.572, which indicates that 57.20% of the variation in students' science achievement can be explained by learning discipline, while the remaining 42.80% is influenced by other variables; moreover, the regression analysis reveals a significant positive effect, as evidenced by an F-value of 136.428 with a significance level of $p < 0.05$, and the regression equation $\hat{Y} = -21.019 + 1.210X_1$ suggests that each one-point increase in learning discipline leads to an increase of 1.210 points in science achievement, indicating that learning discipline serves as a strong predictor of academic performance.

Similarly, the relationship between learning motivation and science achievement demonstrates an even stronger association, with a correlation coefficient of r = 0.853 and a coefficient of determination of 0.727, meaning that 72.70% of the variation in students' achievement is explained by learning motivation, while 27.30% is attributed to other factors; the ANOVA results further confirm a significant effect, with an F-value of 271.750 and $p < 0.05$, and the regression equation $\hat{Y} = 2.354 + 0.492X_2$ indicates that each one-point increase in learning motivation contributes to an increase of 0.492 points in achievement, thereby suggesting that learning motivation has a very strong influence on students' academic outcomes.

Finally, the simultaneous analysis of learning discipline and motivation through multiple regression reveals a significant combined effect on students' science achievement, as indicated by an F-value of 222.962 with a significance level of 0.000, while the coefficient of determination (R^2) of 0.785 shows that 78.50% of the variation in achievement is jointly explained by both variables, with the remaining 21.50% influenced by other factors; the regression equation $\hat{Y} = -17.259 + 0.442X_1 + 0.388X_2$ implies that a one-point increase in learning discipline contributes 0.442 points to achievement, while a one-point increase in learning motivation contributes 0.388 points, thereby demonstrating that both variables have a strong and significant combined influence on students' science achievement, with learning motivation showing a slightly greater contribution compared to learning discipline.

Discussion

The findings of the study and hypothesis testing indicate that the proposed hypotheses are accepted, showing that there is a significant effect between learning discipline and students' academic achievement, a significant influence of learning motivation on students' academic achievement, and a positive and significant simultaneous effect of learning discipline and learning motivation on students' learning outcomes; these findings are in line with recent studies highlighting that non-cognitive factors such as self-regulation, learning engagement, and motivation contribute significantly to students' academic success (Fong & Schallert, 2023).

Description of Students' Learning Discipline in Public Junior High Schools in Luwu Regency

Based on the results of the descriptive analysis, students' learning discipline in public junior high schools in Luwu Regency is categorized as moderate to high, with a mean score of 79.89, a median of 81.00, and a mode of 82.00, where the mean being close to the median indicates a relatively normal data distribution without significant skewness, while the standard deviation of 4.79 suggests low variability, meaning that students' discipline levels are relatively homogeneous; moreover, the score range from 63 to 88 indicates that although differences in discipline exist, most students tend to demonstrate fairly good adherence to learning rules, confirming that learning discipline has been established, although not yet fully optimal across all students.

The frequency distribution shows that the majority of students fall into the high (40%) and moderate (32%) categories, while the very low and very high categories have relatively small proportions, indicating that most students have developed structured learning habits such as punctuality, task completion, and consistency in learning activities; however, a group of students with low discipline still exists and requires special attention, suggesting that the development of learning discipline is not evenly distributed and is influenced by both intrinsic and extrinsic factors such as study habits, school control, and family environment in the post-pandemic context.

These findings are consistent with recent studies indicating that students' learning discipline at the junior high school level generally falls within moderate to high categories but is not yet evenly distributed, as highlighted by Wahyuni (2024), who found that discipline is influenced by the consistency of school rule enforcement and parental involvement, as well as by Nofiazein (2021), who noted that post-pandemic learning patterns still affect time management and task compliance; theoretically, learning discipline is part of self-regulated learning, emphasizing students' ability to control their learning behavior independently, where students with high discipline tend to manage time effectively, set priorities, and take responsibility for academic tasks, ultimately contributing to academic success (Zimmerman & Schunk, 2013; Duckworth et al., 2019), thus requiring systematic efforts from schools and

families to further enhance and equalize discipline levels among students.

Description of Students' Learning Motivation in Public Junior High Schools in Luwu Regency

Based on the descriptive analysis, students' learning motivation is generally categorized as moderate, with a mean score of 148.38, a median of 143.00, and a mode of 144.00, where the mean being higher than the median indicates a slight tendency toward higher scores, suggesting that some students already demonstrate relatively strong motivation; however, the standard deviation of 12.62 reflects greater variability compared to discipline, indicating that motivation levels are more diverse among students, while the wide score range from 120 to 195 highlights disparities in motivation that require attention in the learning process.

The frequency distribution shows that most students fall into the moderate category (42.40%), followed by the high category (25.6%), while the low category remains relatively significant (22.40%), indicating that students' motivation has not yet reached an optimal level, as many students still demonstrate inconsistent enthusiasm, persistence, and engagement in learning activities; this condition is influenced by intrinsic factors such as interest and learning goals, as well as extrinsic factors such as the learning environment and teaching methods.

These findings align with recent studies showing that students' learning motivation at the junior high school level tends to be moderate, particularly in the post-pandemic period, as noted by Patmawati (2025), who found a decline in motivation due to changes in learning patterns and reduced face-to-face interaction, and Siregar (2023), who emphasized the importance of environmental support, teaching strategies, and relevance of learning materials; theoretically, motivation serves as the driving force determining the direction, intensity, and persistence of learning behavior, where strong motivation, especially intrinsic motivation, enhances engagement, resilience, and learning outcomes (Ryan & Deci, 2020; Schunk & DiBenedetto, 2020; Hidi & Renninger, 2006), thus requiring innovative and supportive pedagogical interventions to strengthen and evenly distribute students' motivation.

Description of Students' Science Learning Achievement in Public Junior High Schools in Luwu Regency

The descriptive analysis shows that students' science learning achievement is generally categorized as moderate, with a mean score of 75.62, a median of 75.50, and a mode of 68.50, where the mean being slightly higher than the median indicates a relatively balanced distribution with a slight tendency toward higher scores, while the standard deviation of 7.49 suggests moderate variability, meaning that differences in achievement exist but are not extreme; the score range from 62 to 91 reflects a noticeable gap between low- and high-achieving students, indicating heterogeneity in academic ability.

The frequency distribution reveals that the largest proportion of students falls into the low category (35.20%), followed by the high category (29.60%), while the moderate category accounts for only 17.60%, indicating that although the average achievement is moderate, a substantial number of students still perform at lower levels, suggesting that academic achievement is not evenly distributed and is influenced by both intrinsic factors such as motivation and discipline and extrinsic factors such as the learning environment and instructional quality.

These findings are consistent with recent studies and international assessments such as PISA (2022), which show that Indonesian students' literacy and science competencies remain below the international average, highlighting challenges in improving educational quality, while other studies emphasize that achievement is influenced by affective factors such as motivation and discipline and has been affected by learning loss during the pandemic (Engzell et al., 2021); theoretically, learning achievement reflects the success of the educational process and is influenced by students' ability, effort, and opportunities, as well as affective and behavioral factors (Schunk & DiBenedetto, 2020), thus requiring comprehensive and integrated interventions to improve achievement more evenly and sustainably.

Relationship between Learning Discipline and Students' Science Achievement

The inferential analysis shows a correlation coefficient of 0.756, indicating a strong and positive relationship between learning discipline and students' science achievement, while the coefficient of determination of 0.572 indicates that 57.20% of the variation in achievement can be explained by discipline, with the remaining 42.80% influenced by other factors; this is supported by regression results showing $R = 0.775$ and $R^2 = 0.600$, indicating a relatively high contribution of discipline.

The ANOVA results show an F-value of 184.410 with a significance level of 0.000 (< 0.05), confirming a significant effect of discipline on achievement, meaning that higher levels of discipline lead to higher academic performance; the regression equation $\hat{Y} = -21.019 + 1.210X_1$ indicates that each one-point increase in discipline increases achievement by 1.210 points, confirming discipline as a strong predictor of academic success.

This finding aligns with previous studies emphasizing that disciplined students tend to achieve

better academic outcomes due to effective time management and responsibility (Wahyuni, 2024), and within the self-regulated learning framework, discipline represents self-control that guides consistent learning behavior (Zimmerman & Schunk, 2013; Duckworth et al., 2019), making it a key strategy for improving academic achievement.

Relationship between Learning Motivation and Students' Science Achievement

The analysis shows a correlation coefficient of 0.853, indicating a very strong and positive relationship between learning motivation and science achievement, with a coefficient of determination of 0.727, meaning that 72.70% of achievement variation is explained by motivation; this is supported by $R = 0.866$ and $R^2 = 0.750$, indicating a very high contribution.

The ANOVA results show an F-value of 369.687 with a significance level of 0.000 (< 0.05), confirming a significant effect of motivation on achievement, where higher motivation leads to higher academic performance; the regression equation $\hat{Y} = 2.354 + 0.492X_2$ indicates that each one-point increase in motivation increases achievement by 0.492 points, highlighting motivation as a strong predictor.

These findings are consistent with studies emphasizing motivation as a dominant factor in academic success, where motivated students demonstrate higher engagement, persistence, and better outcomes (Patmawati, 2025), and according to self-determination theory, intrinsic motivation enhances independent and sustained learning (Ryan & Deci, 2020; Schunk & DiBenedetto, 2020), making it a key factor in improving academic performance.

Relationship between Learning Discipline, Motivation, and Students' Science Achievement

The multiple regression analysis shows an F-value of 222.962 with a significance level of 0.000 (< 0.05), indicating that learning discipline and motivation simultaneously have a significant effect on students' achievement, confirming that academic success is the result of the interaction between these two variables; the correlation coefficient (R) of 0.886 indicates a strong relationship, while the coefficient of determination (R^2) of 0.785 shows that 78.50% of achievement variation is explained jointly by discipline and motivation.

The regression equation $\hat{Y} = -17.259 + 0.442X_1 + 0.388X_2$ indicates that both variables have positive effects, where a one-point increase in discipline increases achievement by 0.442 points and a one-point increase in motivation increases achievement by 0.388 points, with motivation showing a slightly stronger contribution based on standardized coefficients; thus, improving both discipline and motivation simultaneously leads to more optimal academic outcomes.

These findings are consistent with recent studies emphasizing that academic achievement is influenced by a combination of cognitive and non-cognitive factors, where discipline shapes structured learning habits and motivation drives engagement (Wahyuni, 2024), and within the self-regulated learning framework, both are essential components enabling effective independent learning (Zimmerman & Schunk, 2013; Schunk & DiBenedetto, 2020), with integrated approaches that enhance both factors proving more effective than treating them separately (Ryan & Deci, 2020; Hidi & Renninger, 2006).

Conclusion

Based on the results of descriptive and inferential analyses, it can be concluded that the level of learning discipline among public junior high school students in Luwu Regency is categorized as moderate to high, while learning motivation falls within the moderate category, and students' science learning achievement is also generally at a moderate level, although a considerable proportion still falls into the low category. This indicates that the quality of learning outcomes is not yet evenly distributed and still requires further attention. Partially, learning discipline has a positive and significant effect on science learning achievement, with a contribution of 57.20%. This means that the higher the level of students' discipline, the better their academic achievement. Meanwhile, learning motivation demonstrates a stronger and more significant influence, with a contribution of 72.70%, indicating that motivation is the dominant factor in improving students' academic achievement. Simultaneously, learning discipline and motivation have a positive and significant combined effect on science learning achievement, with a contribution of 78.50%. This finding confirms that academic success is not determined by a single factor, but rather by the interaction between students' discipline in managing the learning process and their internal drive to learn. Therefore, improving students' science learning achievement in Luwu Regency requires an integrated approach, namely by strengthening learning discipline while simultaneously enhancing students' learning motivation. These efforts can be implemented through innovative learning strategies, strengthening the roles of teachers and parents, and creating a learning environment that supports the sustainable development of both cognitive and non-cognitive aspects.

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Author Contributions
Conceptualization, resources, methodology, writing—review and editing, project administration, data curation, writing—original draft preparation, F.U.A. and F.D.; conceptualization, resources, writing—review, validation, H.H., M.P., and M.A. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest
The authors declare no conflict of interest.

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