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The Relationship Between School Environment Factors and Students Biology Learning Outcomes

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Abstract: Education quality is fundamentally influenced by various factors, with the school environment playing a crucial role in shaping student learning outcomes. The school environment encompasses physical, social, and academic aspects that collectively affect students' comfort and motivation to learn. This study aims to determine the relationship between school environmental factors and biology learning outcomes of grade VII MTsN 3 Mataram students. The school environment encompasses physical, social, and academic aspects that collectively impact students' comfort and motivation to learn. This study employs a correlational, quantitative, descriptive method. The population consisted of all students of grade VII, with samples taken from grades VII-4 and VII-5 using purposive sampling techniques. Data collection techniques include questionnaires and documentation of student learning outcomes. The questionnaire instrument was validated using Aiken's V formula and tested for reliability with Cronbach's alpha, both of which yielded valid and reliable results. The normality test indicates that the data are normally distributed, and the linearity test reveals a linear relationship between the variables. Correlation analysis yielded a coefficient of r = 0.608, indicating a strong and significant relationship at a 5% significance level (r calculated exceeds the r table value). Thus, it is concluded that there is a positive and significant relationship between school environmental factors and students' biology learning outcomes. These findings can serve as input for teachers and schools in creating a supportive learning environment to enhance the educational process.

Keywords: Biology; Correlations; Learning Environment; Educational Process; Learning Outcomes.

Introduction

Education has a fundamental role as the main pillar in shaping the quality of a nation's human resources. The success of the education system can be measured through various indicators, with the achievement of student learning outcomes being one of the most significant parameters. The complexity of factors that affect student learning outcomes is not limited to internal aspects, such as intrinsic motivation and individual cognitive capacity, but is also significantly influenced by external factors, especially the condition of the school environment, which is the main setting for the learning process. The school environment is a complex and multidimensional learning ecosystem, encompassing physical, social, and psychological aspects that synergistically form a learning atmosphere. The physical dimension encompasses building infrastructure, learning facilities, and the geographical conditions of the school, while the social dimension encompasses the pattern of interaction among school residents. The psychological dimension encompasses the emotional and motivational climate that is created within the school community. These three dimensions interact with and influence one another to create optimal learning conditions.

Recent studies have underscored the crucial role of the learning environment in shaping educational outcomes. Inquiry-based instruction combined with environmental literacy significantly enhanced students' understanding of ecosystem concepts, highlighting how environmental factors can be strategically utilized to improve comprehension of complex biological concepts [1]. Similarly, four overarching environmental factors in higher education, instructor quality, course design, class climate, and available resources, were identified as interrelated and interdependent in fostering student well-being and academic success [2]. These findings align with the understanding that the learning environment encompasses multidimensional aspects that synergistically influence educational outcomes.

Jannah et al In his research, it is emphasized that a conducive learning environment has a positive correlation with the level of activity and comfort of students in the learning process [3]. A supportive school atmosphere has a significant impact on students' mental and emotional readiness to receive learning materials. The concept of school atmosphere refers to the overall psychological and social climate that students perceive while in the school environment, encompassing aspects of safety, order, and a positive learning environment. Recent research conducted by Latief revealed that a safe, orderly, and fun school atmosphere has a direct impact on the creation of positive learning conditions, which further increases students' focus of attention and interest in learning [4]. Safety in this context refers not only to physical safety but also to psychological security that allows students to express themselves without fear or anxiety. Regularity includes a clear organizational structure and consistency in the application of school rules, while the fun aspect has to do with a positive atmosphere that encourages intellectual exploration and creativity.

Infrastructure components and learning infrastructure facilities are other crucial elements in the school

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environment that affect learning outcomes. The availability of learning tools such as interactive whiteboards, digital learning media, laboratory teaching aids, and an adequate collection of textbooks is a determining factor in the effectiveness of the knowledge transfer process. Complete and quality infrastructure facilities not only facilitate a deeper conceptual understanding but also increase students' active participation in learning activities. This finding aligns with Jalil & Hidayatullah's research, which demonstrates that the effective use of media and learning tools significantly accelerates the process of internalizing information by learners, while improving long-term knowledge retention [5].

The significance of laboratory facilities and instructional resources has been further emphasized in recent research. Laboratories, curriculum quality, and teacher competence significantly and positively influence students' academic outcomes in science subjects at the secondary level in Pakistan [6]. Their study revealed that well-equipped laboratories enable students to engage in experimental learning, develop critical thinking skills, and explore innovative approaches to problem-solving. This underscores the importance of adequate infrastructure not merely as a supporting element but as a fundamental determinant of science learning effectiveness.

The social dimension of the school environment, particularly the quality of interpersonal relationships between teachers and students, makes a substantial contribution to students' academic achievement. Teachers who show an open, friendly, and caring attitude towards student development are able to build effective two-way communication, create a sense of belonging and increase students' intrinsic motivation to learn. A dialogical and responsive communication pattern enables the creation of a democratic learning environment, where students feel valued as unique individuals with diverse learning potentials and needs. Their study emphasized that quality interpersonal relationships between teachers and students have a positive impact on strengthening student confidence and developing a sense of academic responsibility [7]. Teachers who can develop warm yet professional relationships with students tend to be more successful in motivating students to reach their full academic potential. This happens because positive relationships create a safe psychological environment, where students are less afraid to make mistakes and are more courageous in learning.

No less important is the quality of horizontal relationships between systems that help form a supportive learning ecosystem. Students who have healthy social relationships with peers will experience increased sense of comfort in study groups, active participation in class discussions, and a tendency to support each other in understanding the subject matter. These positive social dynamics create a collaborative learning environment that facilitates peer learning and social scaffolding, where students support one another in overcoming learning difficulties. A conducive social environment also serves as a protective factor, preventing students from various negative psychological pressures, such as bullying, discrimination, or social isolation, that can hinder their learning process. Students who are in a supportive social environment will experience a decrease in stress and anxiety levels, which further allows them to focus on academic activities and optimize their cognitive capacity.

The importance of peer interaction in the learning environment has gained increasing attention in contemporary educational research. 3,263 college students across 28 universities in China, and found that peer interaction positively affects learning outcomes, with attitude and self-efficacy acting as chain mediators in this relationship [8]. This finding reinforces the notion that horizontal relationships among students constitute a critical component of the learning ecosystem, facilitating collaborative knowledge construction and enhancing academic achievement through social scaffolding mechanisms.

Learning biology as one of the science subjects has unique characteristics that require a special pedagogical approach. Biology involves understanding abstract and concrete concepts simultaneously, requiring complex observation, analysis, and synthesis skills. Therefore, biology learning environments must be designed to accommodate these specific learning needs, including the availability of adequate laboratories, specimens, and learning models, as well as visual media that support the understanding of biological concepts. Preliminary observations conducted at MTsN 3 Mataram revealed significant variations in the achievement of interclastic biology learning outcomes. Classrooms with a more conducive learning atmosphere, characterised by harmonious teacher-student relationships, well-equipped learning facilities, and positive patterns of social interaction between students, tend to achieve higher learning outcomes compared to other classes. This phenomenon indicates a potential correlation between the quality of the school environment and students' academic performance, especially in biology subjects.

While previous studies have explored various aspects of the school environment and learning outcomes, several research gaps remain unaddressed. School environment-based Contextual Teaching and Learning (CTL) models significantly improved both creativity and biology learning outcomes in high school students, with experimental groups showing substantially higher mean scores (87.75 for creativity and 84.94 for learning outcomes) compared to control groups [9]. However, their study focused on a specific pedagogical intervention rather than examining the natural state of school environmental factors. The utilization of the school environment as a learning resource achieved excellent ratings (82.5%) across teaching methods, school discipline, learning tools, and school time, yet their research primarily assessed learning activities rather than investigating the correlational relationship between environmental factors and academic achievement [10]. Investigated the relationship between school environment utilization as a learning resource and cognitive science learning outcomes among seventh-grade students at SMPN 4 Polewali, finding a significant but low correlation ($r = 0.320$), with the school environment contributing only 10.24% to learning outcomes variance [11]. This finding suggests that while a relationship exists, the strength and contribution of school environmental factors may vary significantly across different educational contexts and require further investigation, particularly in specialized educational institutions such as madrasahs. Furthermore,

while studies like those by Ilmiah and have identified that teachers' utilization of the school environment as a learning resource remains limited and advocate for its use as a "living laboratory," there is insufficient empirical evidence regarding how the comprehensive dimensions of the school environment encompassing physical facilities, social interactions, and psychological climate collectively correlate with subject-specific learning outcomes, particularly in biology at the madrasah tsanawiyah level [12]. The integration of environmental education has proven effective in improving students' environmental knowledge, attitudes, and behaviors [13], yet the specific relationship between the school's internal environmental factors and biology learning outcomes in Islamic educational institutions remains underexplored.

Most existing studies tend to examine school environment as a singular construct or focus on specific interventions rather than exploring its distinct components (school atmosphere, learning facilities, teacher-student relationships, and peer interactions) and their collective natural influence on biology learning outcomes. This gap is particularly evident in the Indonesian madrasah context, where the unique organizational culture and learning environment may differ substantially from general public schools.

Several previous studies have explored the relationship between school environment and learning outcomes across various contexts. Reski (2018) found a strong correlation (r = 0.700) between school environment and Indonesian language learning outcomes in elementary schools [12]. Similarly, Frans & Mentang (2025) reported that the school social environment contributed 43.3% to student achievement in junior high schools [20]. However, these studies primarily focused on general subjects and elementary education levels. Research specifically examining the multidimensional aspects of the school environment, encompassing physical facilities, social interactions, and psychological climate, in relation to science learning outcomes, particularly biology at the madrasah tsanawiyah level, remains limited. Most existing studies tend to examine school environment as a singular construct rather than exploring its distinct components (school atmosphere, learning facilities, teacher-student relationships, and peer interactions) and their collective influence on subject-specific learning outcomes. Furthermore, there is a notable gap in understanding how these environmental factors interact to support biology learning, which requires both theoretical understanding and practical application in laboratory settings.

This study addresses these gaps by providing a comprehensive analysis of multiple dimensions of the school environment and their relationship with biology learning outcomes, specifically in the context of the madrasah tsanawiyah. The novelty of this research lies in its holistic approach to examining four distinct yet interrelated components of the school environment: school atmosphere, availability of learning tools and facilities, teacher-student relationship quality, and student-to-student relationship dynamics and investigating their collective contribution to biology learning achievement. Additionally, this study offers unique insights into Islamic educational institutions (madrasah), which have distinct organizational cultures and learning environments compared to general public schools, yet have received less attention in educational research. By focusing on grade VII students during their critical transition period and employing validated instruments specifically designed to measure multidimensional school environmental factors, this research provides empirical evidence that can inform evidence-based practices for creating optimal learning environments in biology education at madrasah institutions.

These preliminary observational findings are a strong basis for conducting a more comprehensive and systematic scientific investigation of the relationship between school environmental factors and biology learning outcomes. Given the importance of a deep understanding of the factors that affect students' academic achievement, this research is both relevant and urgent to conduct, especially in the context of efforts to improve the quality of science education at the tsanawiyah madrasah level. Based on the complexity of the problems described, this study focuses on the research question: What is the relationship between school environmental factors and the biology learning outcomes of grade VII MTsN 3 Mataram students? This research question is designed to explore and empirically analyze the causal relationship between various components of the school environment and students' academic achievement in biology subjects.

The purpose of this study is to analyze and describe the relationship between school environmental factors and biology learning outcomes of grade VII MTsN 3 Mataram students. This research is expected to make both theoretical and practical contributions to the development of educational science, particularly in the fields of educational psychology and learning environment management. Practically, the results of this research are expected to be a reference for education practitioners in designing and optimizing a school environment that is conducive to achieving maximum learning outcomes.

Research Methods

Types of Research

This study is a correlation study that aims to investigate the relationship between the school environment variable (X) and the biology learning outcome variable (Y). The researchers did not control for the treatment that had occurred prior to the study. The research employs a quantitative descriptive method, describing variables as they are, supported by data in the form of numbers generated from actual circumstances.

Research Variables

The free variable (X) refers to the school environment, which is a variable that the researcher regulates and manipulates to determine its relationship with the bound variable. The bound variable (Y) is a student learning outcome that is measured to see the changes or effects caused by the independent variable.

Population and Sample

A population is a generalised area consisting of objects or subjects that have certain qualities and

characteristics, which researchers apply to study and then draw conclusions from, using them as a source of data in research. The research population consists of 6 MTsN 3 Mataram classes with a total of 216 students in class VII. A sample is a part of the population that is used as an object or subject of research. Purposive sampling is a non-random sampling technique where the researcher selects samples that are suitable for the research purpose, enabling them to address the research problem [14]. The research sample was divided into two classes, namely VII4 and VII5.

Research Instruments

The research instrument employs non-test instruments, consisting of observation, documentation, and questionnaire instruments, while the test instrument takes the form of student semester learning outcomes.

Data Collection Techniques

A questionnaire is a data collection technique that is carried out by giving a set of questions or written statements to respondents to be answered [15]. The questionnaire was intended to find out data information about the relationship between school environmental factors and the learning outcomes of Grade VII students at MTsN 3 Mataram with the categories of very good (80-100), good (66-79), good (56-65), poor (40-55), and very bad (0-39). Observation is the activity of recording and explaining an event by interpreting the circumstances to produce a report. Documentation is a data collection technique by collecting and analyzing documents, both written, image and electronic documents [16]. Student learning outcomes are the results of achievements, understanding, and learning processes, as well as the evaluation of student competencies, based on the final test scores of the biology semester for grade VII MTsN 3 Mataram students.

Questionnaire Instrument Test

The validity of the content is ensured because the research employs an instrument grid that includes variables to be researched, indicators, and question items or descriptive statements corresponding to the indicators. The Aiken validity index is a method often used to measure the validity of content, with the formula $V = \Sigma S / [n/(C-1)]$, where $S = R – L0$. The interpretation categories of Aiken's V values are presented in Table 1.

Table 1. Aiken's V Validity Interpretation Criteria

Aiken's V Score	Interpretation Category
0.81 - 1.00	Very High/Very Valid
0.61 - 0.80	High
0.41 - 0.60	Fair
0.21 - 0.40	Low
0.00 - 0.20	Very Low/Invalid

Source: [7]

Reliability testing using Alpha Cronbach was conducted to assess the internal consistency of the instrument. The interpretation criteria for Alpha Cronbach reliability coefficients are presented in Table 2.

Table 2. Alpha Cronbach Reliability Interpretation Criteria

Alpha Cronbach (α) Value	Interpretation Category
$\alpha \geq 0.90$	Very Good
$0.80 \leq \alpha < 0.90$	Good
$0.70 \leq \alpha < 0.80$	Adequate
$0.60 \leq \alpha < 0.70$	Doubtful
$0.50 \leq \alpha < 0.60$	Poor
$\alpha < 0.50$	Unacceptable

Source: [8]

Prerequisite Test

The normality test was carried out to find out whether the data in the study were normally distributed or not, with the criteria $p > 0.05$ indicating normally distributed data and $p \leq 0.05$ indicating abnormal data [17]. The linearity test is used to determine whether the relationship between two variables (X and Y) is linear or not by examining the correlation coefficients. Linearity $p < 0.05$ indicates that there is a significant linear relationship, whereas in the column, deviation from linearity $p > 0.05$ indicates no linearity deviation [18].

Data Analysis Techniques

Correlation test Product Moment used to find out whether or not the school environment variables have a relationship with student learning outcomes using the formula $rxy = n\Sigma xy - (\Sigma x)(\Sigma y)/\sqrt{\{n\Sigma x^2 - (\Sigma x)^2\}\{n\Sigma y^2 - (\Sigma y)^2\}}$ (Sugiyono, 2015). The interpretation of the correlation coefficient was categorized into very high/very strong (0.80-1.000), high (0.60-0.799), moderate (0.40-0.599), low/weak (0.20-0.399), and very low/no relationship (0.00-0.199) (Sugiyono, 2015). The significance test was carried out to test the level of significance of the correlation between variable X and variable Y, with the criterion that if tcount > ttable, then Ho is rejected and Ha is accepted, while if tcount < ttable, then Ho is accepted and Ha is rejected at a significance level of 95% with dk = n-2 [19].

Results and Discussion

Validity and Reliability of Research Instruments

Validity of the Instrument by the Expert

The research instrument validation process is conducted through a comprehensive evaluation by two expert validators who possess competence in the fields of biology education and research methodology. Expert validation is a crucial stage in ensuring the quality of the instrument before it is used to collect research data. Based on the evaluation results, Aiken's V score indicates a very adequate level of validity for all assessed aspects. Of the nine aspects evaluated, seven aspects obtained a score of 0.875, which was included in the high category, while the other two aspects obtained a score of 0.75 and 0.625, which were categorized as moderate.

The average validity score reached 0.83, which indicates that the research instrument has a high level of validity and is suitable for measuring school environmental factors. These results demonstrate that the construction of the instrument aligns with the theory and concepts underlying

the research and is capable of accurately measuring the variables in question. This high content validity is a strong basis for continuing the empirical validation process through trials of target respondents. All aspects assessed included material relevance, language accuracy, clarity of instruction, and suitability with respondents' characteristics.

Table 3. Validity Test Results

Aspects assessed	Aiken's V Score	Category
1	0.875	Tall
2	0.875	Tall
3	0.875	Tall
4	0.875	Tall
5	0.875	Tall
6	0.75	Keep
7	0.875	Tall
8	0.875	Tall
9	0.625	Keep
Average	0.83	Tall

Based on the data, it is known that the average validity test results for all instruments are valid. The results of the average validity calculation have been found that all research instruments are classified as high (valid). Regarding the research results, the research instruments, which have been validated by the two validators, are suitable for use and will continue in the trial process for respondents. The validation calculations in those tables, as performed using Microsoft Excel, are presented in the appendix.

Validity of Statement Items

Empirical validation was conducted on the items of the school environmental factor questionnaire through a trial involving students in grades VII-4 and VII-5, with a total of 32 respondents. The validation process employed Pearson's product-moment correlation analysis, with validity criteria based on the comparison between r_hitung and r_tabel at a significance level of 5%. The r_tabel value for the number of respondents, 32, is 0.349, so the statement item is declared valid if it has an r_hitung value greater than or equal to 0.349.

The results of the analysis showed that out of the 50 statement items tested, 38 items were declared valid and met the set statistical criteria. The valid items are numbers 1, 2, 3, 5, 7, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 41, 43, 44, 46, and 50. A total of 12 statement items were declared invalid because they had correlation coefficient values below the required minimum limit. These invalid items are numbers 4, 6, 9, 11, 36, 39, 40, 42, 45, 47, 48, and 49, so they are eliminated from the final instrument to be used in the collection of research data.

Instrument Reliability

Reliability testing was performed on 38 statement items that had been previously validated using the Cronbach's Alpha method. Reliability is an indicator of the internal consistency of the instrument, measuring the extent to which the measurement results are reliable and stable when used repeatedly under the same conditions. The results of the analysis yielded a reliability coefficient value of 0.745, which fell within the sufficient category according to the established reliability coefficient interpretation criteria.

A reliability value of 0.745 indicates that the instrument has an adequate level of consistency for use in the study. Although it is in the sufficient category, this value is still above the minimum limit of 0.60 that is generally accepted in social and educational research. This sufficient internal consistency shows that the statement items in the instrument are correlated with each other and measure the same construct, i.e. the school environment factor. Adequate reliability ensures that the measurement results are not overly influenced by random factors, providing a consistent picture of students' perceptions of the school environment.

Results of the Analysis Prerequisite Test

Data Normality Test

Normality testing is performed to verify the basic assumption that the residual data are normally distributed, a crucial prerequisite for regression and parametric correlation analysis. The normality test employed the Kolmogorov-Smirnov technique, utilising the SPSS version 25 program. The test results showed a significance value of 0.200, which was greater than the alpha level of 0.05; therefore, the null hypothesis stating that the data were normally distributed was accepted.

The normal distribution of residual data indicates that the regression model meets the assumptions of linearity and homogeneity, and that there are no significant deviations from the normal distribution. This condition allows the use of parametric statistics for further analysis and guarantees the validity of statistical inference results. The normality of the data also indicates that there are no extreme outliers that can substantially affect the analysis results.

Relationship Linearity Test

Linearity testing aims to verify whether the relationship between independent variables (school environmental factors) and dependent variables (biology learning outcomes) is linear. The linearity test was carried out using the Test for Linearity technique in variance analysis, with decision-making criteria based on the significance value of the deviation from linearity. The results of the analysis showed a significance value of 0.838 for deviation from linearity, which was greater than the alpha value of 0.05.

Significance values that exceed the critical limit indicate that the relationship between school environmental factors and biology learning outcomes is linear. The linearity of this relationship fulfils the basic assumptions for the use of product-moment correlation analysis and simple linear regression. The linear relationship shows that any change in the variables of school environmental factors will be followed by a proportionate change in the variables of biological learning outcomes, both in positive and negative directions.

Description of School Environmental Factors

School Atmosphere Profile

A descriptive analysis of the school atmosphere's dimensions revealed a fairly diverse variation in student perception between the two classes studied. In grades VII-4, the majority of students (25 respondents or 78.1%) rated the school atmosphere in the category as quite good with an average score of 60.10. Meanwhile, only 2 respondents (6.3%) rated the school atmosphere as good, and 5 respondents (15.6%) rated it as poor. A slightly different pattern was observed in grades VII-5, where 22 respondents (68.8%) rated the school atmosphere as quite good, and 10 respondents (31.3%) rated it as good, with a higher average score of 64.13.

The difference in perception between the two classes suggests the presence of micro-factors that influence the learning atmosphere at the classroom level. The school atmosphere, which is considered quite good, indicates that the physical and psychological environment of the school is generally conducive to learning, although there is still room for improvement. The evaluation of the school atmosphere encompasses aspects of environmental cleanliness, safety, facility comfort, and the learning environment that support students' academic activities.

Table 4. Recapitulation of Sub-Indicators (School Atmosphere) in the School Environment Factor Questionnaire for Grade VII-4 Students at MTSN 3 Mataram

Category	Score interval	Frequency	Percentage
Excellent	80-100	0	0.00
Good	66-79	2	72.31
Pretty Good	56-65	25	60.80
Not Good	40-55	5	53.84
Very bad	0-39	0	0.00
	Sum	32	
Average			60.10

Table 4 shows that as many as 2 respondents stated that the school atmosphere was classified as good, with a percentage (72.31), 25 respondents stated that the school atmosphere was classified as quite good, with a percentage (60.80), 5 respondents stated that the school atmosphere was classified as a bad category, with a percentage (53.84). The average school atmosphere is classified as quite good, with a percentage of 60.10.

Table 5. Recapitulation of Sub-Indicators (School Atmosphere) in the School Environment Factor Questionnaire for Grade VII-5 Students at MTSN 3 Mataram

Category	Score interval	Frequency	Percentage
Excellent	80-100	0	0.00
Good	66-79	10	68.92
Pretty Good	56-65	22	61.96
Not Good	40-55	0	0.00
Very bad	0-39	0	0.00
	Sum	32	
Average			64.13

Table 5 shows that as many as 10 respondents stated that the school atmosphere was classified as good, with a percentage of 68.92%, and 22 respondents stated that the school atmosphere was classified as fairly good, with a percentage of 61.96%. The average school atmosphere is classified as quite good, with a percentage of 64.13.

Condition of Learning Tools and Facilities

Evaluation of the availability and quality of learning tools showed very positive results compared to other dimensions. In class VII-4, as many as 17 respondents (53.1%) rated the learning tools very well, and 15 respondents (46.9%) rated them as good, with an average score of 79.69. Similar conditions were also observed in class VII-5, with even better results, where 23 respondents (71.9%) rated very well, and 9 respondents (28.1%) rated well, with an average score of 81.31.

A positive assessment of the learning tools indicates that MTSN 3 Mataram has provided adequate learning facilities to support the biology learning process. The availability of good-quality learning tools includes textbooks, teaching aids, learning media, laboratory facilities, and educational technology devices. This condition creates a learning environment that supports the optimal understanding of biological concepts and facilitates various interactive and effective learning methods.

Table 6. Recapitulation of Sub-Indicators (Learning Tools) on the School Environmental Factors Questionnaire for Students of Grades VII-4 MTSN 3 Mataram

Category	Score interval	Frequency	Percentage
Excellent	80-100	17	68.92
Good	66-79	15	61.96
Pretty Good	56-65	0	0.00
Not Good	40-55	0	0.00
Very bad	0-39	0	0.00
	Sum	32	
Average			79.69

Table 6 shows that as many as 17 respondents stated that learning tools in schools were classified as very good, with a percentage of 68.92, and 15 respondents stated that school learning tools were classified as good, with a percentage of 61.96. The average learning tools in schools are classified as very good, with a percentage of 79.69.

Table 7. Recapitulation of Sub-Indicators (Learning Tools) in the School Environment Factor Questionnaire for Grade VII-5 MTSN 3 Mataram Students

Category	Score interval	Frequency	Percentage
Excellent	80-100	23	83.48
Good	66-79	9	75.78
Pretty Good	56-65	0	0.00
Not Good	40-55	0	0.00
Very bad	0-39	0	0.00
	Sum	32	
Average			81.31

Table 7 shows that as many as 23 respondents stated that learning tools in schools were classified as very good, with a percentage of 83.48, and 9 respondents stated that school learning tools were classified as good, with a percentage of 75.78. The average learning tools in schools are classified as very good, with a percentage of 81.31.

Quality of Teacher-Student Relations

The quality of the teacher-student relationship was consistently high in both research classes. In grade VII-4, as many as 30 respondents (93.8%) rated the relationship between teachers and students as good, and 2 respondents (6.3%) rated it quite good, with an average score of 70.00. A similar pattern was observed in class VII-5, with 31 respondents (96.9%) rating it as good and 1 respondent (3.1%) rating it as quite good, yielding an average score of 71.60. The quality of a good relationship between teachers and students is a crucial indicator in creating a positive learning environment. Harmonious relationships facilitate effective communication, increase students' motivation to learn, and create a sense of psychological security in the learning process. A quality teacher-student relationship encompasses aspects of open communication, providing constructive feedback, attending to individual student needs, and fostering a learning environment that encourages students' active participation in biology learning activities.

Table 8. Recapitulation of Sub-Indicators (Teacher-Student Relationship) in the School Environment Factor Questionnaire for Grade VII-4 MTSN 3 Mataram Students

Category	Score interval	Frequency	Percentage
Excellent	80-100	0	0.00
Good	66-79	30	70.64
Pretty Good	56-65	2	63.00
Not Good	40-55	0	0.00
Very bad	0-39	0	0.00
	Sum	32	
Average			70

Table 8 shows that as many as 30 respondents stated that the relationship between biology teachers and students at school was classified as good, with a percentage of 70.64, and 2 respondents stated that the relationship between biology teachers and students at school was classified as good, with a percentage of 63.00. The average relationship between biology teachers and students at school is classified as good, with a percentage of 70.00.

Table 9. Recapitulation of Sub-Indicators (Teacher-Student Relationship) in the School Environment Factor Questionnaire for Grade VII-5 MTSN 3 Mataram Students

Category	Score interval	Frequency	Percentage
Excellent	80-100	0	0.00
Good	66-79	31	72.06
Pretty Good	56-65	1	58.00
Not Good	40-55	0	0.00
Very bad	0-39	0	0.00
	Sum	32	
Average			71.6

Table 9 shows that as many as 31 respondents stated that the relationship between biology teachers and students at school was classified as good, with a percentage of 72.06, and 2 respondents stated that the relationship between biology teachers and students at school was classified as good, with a percentage of 58.00. The average relationship between biology teachers and students at school is classified as good, with a percentage of 71.6.

Dynamics of Relationships Between Students

An evaluation of the quality of the relationship between students reveals a significant difference between the two classes. In grades VII-4, the majority of students, namely 18 respondents (56.3%) rated the relationship between students in the good category, 11 respondents (34.4%) rated it quite good, and 3 respondents (9.4%) rated it very good, with an average score of 70.00. Meanwhile, Class VII-5 showed better quality, with 21 respondents (65.6%) rating it as good, 7 respondents (21.9%) rating it as very good, and 4 respondents (12.5%) rating it as quite good, yielding an average score of 72.90.

The quality of good relationships between students reflects a positive social climate in the learning environment. Harmonious social interaction facilitates collaborative learning, increases motivation to learn through *peer support*, and fosters a conducive environment for sharing knowledge and experiences. Positive relationship dynamics between students also contribute to the development of social and emotional skills that are essential for students' holistic development in the context of biology learning.

Table 10. Recapitulation of Sub-Indicators (Student-to-Student Relations) in the School Environment Factors Questionnaire for Students of Grades VII-4 MTSN 3 Mataram

Category	Score interval	Frequency	Percentage
Excellent	80-100	3	0.00
Good	66-79	18	72.67
Pretty Good	56-65	11	62.91
Not Good	40-55	0	0.00
Very bad	0-39	0	0.00
	Sum	32	
Average			70.0

Table 10 shows that as many as 30 respondents stated that the relationship between students and students at school was classified as good, with a percentage of 70.64%, and 2 respondents stated that the relationship between biology teachers and students at school was classified as good, with a percentage of 63.00%. The average relationship between biology teachers and students at school is classified as good, with a percentage of 70.00.

Table 11. Recapitulation of Sub-Indicators (Student-Student Relations) in the School Environment Factor Questionnaire for Grade VII-5 MTSN 3 Mataram Students

Category	Score interval	Frequency	Percentage
Excellent	80-100	7	83.48
Good	66-79	21	75.78
Pretty Good	56-65	4	50.00
Not Good	40-55	0	0.00
Very bad	0-39	0	0.00
	Sum	32	
Average			72.9

Table 11 shows that as many as 7 respondents stated that the relationship between students and their peers at school was classified as very good, with a percentage of 83.48%, and 21 respondents stated that the relationship between students and their peers at school was classified as good, with a percentage of 75.78%. The average relationship between biology teachers and students at school is classified as good, with a percentage of 72.9.

Biology Learning Outcome Profile

The analysis of biology learning outcomes for grade VII students of MTSN 3 Mataram revealed very satisfactory achievements, with all students successfully reaching or exceeding the Minimum Completeness Criteria (MCC) set at 75. The distribution of learning outcomes showed that 7 students (11.1%) achieved the very good category with a score range of 93-100, as many as 42 students (66.7%) achieved the good category with a score range of 84-92, and 14 students (22.2%) achieved the good category with a score range of 75-83.

The achievement of learning outcomes that are entirely above the MCC indicates the effectiveness of the biology learning process at MTSN 3 Mataram. The dominance of students in the good category suggests that the majority of students have effectively mastered basic biology competencies and can apply their knowledge in various contexts. The absence of students who obtain grades below the MCC reflects the success of the learning system in facilitating the achievement of established competency standards and demonstrating consistent learning quality throughout the classroom.

Table 12. Category of Student Learning Outcomes based on MCC 75 (National Education Office, 2018)

Category	Score Interval	Frequency
Excellent	93-100	7
Good	84-92	42
Pretty Good	75-83	14
Not Good	< 75	0

Based on Table 12, it can be seen that there are 7 students with scores between 93-100 who are included in the very good category, there are 42 students with a score between 84-92 who are included in the good category, there are 14 students with a score between 75-83 who are included in the fairly good category, and there are no students who get a score of learning outcomes below the MCC.

Correlation and Significance Analysis

The results of Pearson's product-moment correlation analysis showed a significant positive relationship between school environmental factors and students' biology learning outcomes. The value of the correlation coefficient (r_xy) obtained was 0.608, indicating a positive relationship with a fairly strong correlation. To determine the significance of the relationship, the r_xy value was compared with r_tabel at a 5% significance level, with N = 64, which was 0.244.

The results of the comparison showed that r_xy (0.608) was greater than r_tabel (0.244), so the alternative hypothesis (Ha) stating that there was a significant positive relationship between school environmental factors and biology learning outcomes was accepted, while the null hypothesis (Ho) was rejected. The correlation strength of 0.608 showed that about 37% of the variance in biology learning outcomes could be explained by school environmental factors, while the remaining 63% was influenced by other factors not examined in this study. This positive relationship confirms that improving the quality of the school environment will contribute to a significant improvement in students' biology learning outcomes.

The findings of this study indicate that the condition of the school environment has a meaningful correlation with the academic achievement of students in the subject of Biology at MTsN 3 Mataram. Analysis of school environmental factors reveals that the school atmosphere in grades VII-4 and VII-5 achieved percentages of 60% and 64%, respectively, which fall within the category of quite adequate. This condition illustrates that the majority of students have a positive assessment of the learning atmosphere at the educational institution.

The aspect of learning tool availability showed encouraging results, with percentages of 80% and 81% in the category of 'very adequate'. This indicates that learning support facilities are well available and can be used optimally by students. Meanwhile, the relationship between educators and students obtained scores of 70% and 72%, while the interaction between students reached 70% and 73%, both in the good category. The data indicate that interpersonal relationships in the academic environment have been established harmoniously, supporting the learning process.

Conducive learning environment conditions play a crucial role in optimizing students' cognitive development. A physical environment that includes adequate infrastructure, modern learning tools, and appropriate teaching methodologies significantly affects the effectiveness of the knowledge transfer process. The social dimension, which encompasses harmonious interaction among students, teachers, and fellow students, also contributes to creating a productive learning environment. This research is in line with the findings of Reski and Iskandar et al, which confirms that optimal learning environment conditions are predictors of students' academic success [20], [21].

An ideal learning environment is characterized by a hygienic, comfortable learning room with sufficient lighting and adequate ventilation to create a pleasant learning atmosphere. A well-organised and clean classroom arrangement creates a conducive atmosphere that positively impacts students' attitudes and discipline. Attractive decorations and the right choice of colors can stimulate creativity and create a fun atmosphere, while technology integration facilitates access to information and makes learning more interactive. Research indicates that the physical environment of the classroom has a significant impact on students' academic performance, suggesting that optimal spatial planning can enhance comfort and facilitate a more effective learning process.

These findings align with contemporary research on environmental utilization in science education. Fadillah et al. (2023) reported that student learning activities achieved an average rating of 80.5% (excellent category) when the school environment was utilized as a learning resource, with visual activities (83%), oral activities (84%), and writing activities

(79%) all falling within the excellent category. The effectiveness of environmental-based learning was further corroborated by Dharmadewi and Lium (2025), who found that Contextual Teaching and Learning models based on the school environment significantly improved both learning creativity (mean score 87.75) and biology learning outcomes (mean score 84.94) compared to conventional teaching methods. These studies collectively support the present research's findings that optimizing school environmental factors can substantially enhance biology learning outcomes.

Menrisal et al In his research, it is proven that learning discipline and school environment have a significant correlation with student learning outcomes, where the school environment that includes classroom facilities and atmosphere provides fundamental support in creating a learning comfort [22]. The findings reinforce the results of this study, which explores the relationship between school environmental factors and Biology learning outcomes, indicating that the higher the quality of the school environment that students feel, the greater their probability of achieving optimal learning outcomes.

Research by Idmal & Wahyun shows that there is a significant positive relationship between the use of learning resources and science learning outcomes [23]. The correlational approach in the study concluded that optimizing the use of learning resources in the form of books, the surrounding environment, and visual media was positively correlated with an increase in student learning outcomes. These findings support the results of this study, which shows that the school environment, including the school atmosphere, learning tools, and social interactions within it, contributes to improving Biology learning outcomes [24].

Both studies emphasized the importance of the external environment as a supporting factor for academic success, especially in science subjects. This confirms that the learning process does not only depend on the content of the material and teaching methodology, but is also influenced by how effectively the learning environment or resources are utilized in daily learning activities.

The abundance of diverse plant species representing gymnosperms, angiosperms, pteridophytes, and bryophytes in school surroundings, teachers' utilization of the school environment as a learning resource for biology remains limited. This gap between available environmental resources and their actual utilization in teaching practice suggests that merely having adequate facilities is insufficient; effective pedagogical strategies are required to maximize the educational potential of the school environment. The present study's findings, which demonstrate a strong correlation (r = 0.608) between school environmental factors and learning outcomes, underscore the importance of not only maintaining quality facilities but also actively integrating them into the biology learning process [6]. The use of the school environment as a learning resource can be a fundamental element in shaping and influencing students' knowledge acquisition, especially in Biology subjects closely related to the surrounding environment.

The Biology learning outcomes of grade VII MTsN 3 Mataram students, as reported by 64 respondents, showed a wide variation, with a maximum score of 93 and a minimum of 78. The distribution of learning outcomes showed that 7% of students were in the very good category, 69% in the good category, and 34% in the good category. As stated [25]Learning outcomes are indicators of the abilities students acquire after participating in learning activities and serve as a measure of success in mastering a subject.

Hariyanto et al explained that learning outcomes are the achievement of learning targets that combine mental, emotional, and psychomotor aspects [26]. The level of students' perception of the school climate in learning is one of the factors that affect learning outcomes, where a more positive school climate leads to higher learning outcomes achieved by students.

The correlational analysis results in a correlation coefficient (rxy) of 0.608, which is greater than r. The table at a significance level of 5% (0.244) shows a significant positive relationship between school environmental factors and Biology learning outcomes. These findings are consistent with research by Reski, who obtained a rxy of 0.700, and with a r count of 0.188. French & Mentang. It also reported a correlation coefficient of 0.795, indicating that the school's social environment contributed 43.3% to the improvement of student learning achievement [20], [27], [28]. These findings strengthen the argument that a conducive school environment has a vital role in optimizing student learning outcomes, especially in Biology subjects that require a deep conceptual understanding of natural phenomena.

Interestingly, the correlation strength found in this study (r = 0.608) is notably higher than that found for a lower correlation (r = 0.320) between school environment utilization and cognitive science learning outcomes in seventh-grade students at SMPN 4 Polewali, with environmental factors contributing only 10.24% to outcome variance [2]. This discrepancy may be attributed to several factors. First, the present study examined comprehensive school environmental factors encompassing four distinct dimensions (school atmosphere, learning facilities, teacher-student relationships, and peer interactions), whereas Rahman and Hajar's study focused specifically on the utilization aspect of the school environment as a learning resource. Second, the difference in institutional context MTsN 3 Mataram as an Islamic educational institution versus a general public junior high school, may reflect variations in how environmental factors are integrated into the learning process. Third, the present study specifically focused on biology learning outcomes, which may benefit more substantially from environmental factors due to the subject's inherent connection with natural phenomena and hands-on learning experiences, compared to general science learning outcomes. These variations underscore the complexity of the relationship between school environmental factors and learning outcomes, highlighting the importance of considering contextual factors, subject specificity, and the multidimensional nature of the school environment when interpreting correlational findings.

The correlation coefficient obtained in this study (r = 0.608) is consistent with international research, which demonstrates the significant impact of school internal factors on science learning outcomes. Laboratories, curriculum quality, and teacher quality have a significant and positive influence on students' academic outcomes in science subjects at secondary schools in Punjab, Pakistan. Their structural equation modelling revealed that these internal school factors not only directly affect learning outcomes but also

enable students to develop critical thinking skills and innovative problem-solving approaches. This international evidence strengthens the generalizability of the present study's findings and suggests that the relationship between school environmental factors and science learning outcomes transcends cultural and geographical boundaries [13].

Moreover, the digital dimension of the learning environment is increasingly relevant. That peer interaction in digital learning environments positively affects learning outcomes through the mediating roles of attitude and self-efficacy [10]. While the present study focused on the physical and social dimensions of the school environment, future research should consider investigating how the integration of digital learning tools within the school environment might further enhance biology learning outcomes, particularly as educational technology becomes increasingly prevalent in madrasah settings.

Implications for Biology Education Practice

The strong positive correlation identified in this study has significant implications for biology education practice, particularly in leveraging the school environment as a resource for active learning. Inquiry-based instruction combined with information literacy significantly enhanced students' understanding of ecosystem concepts, material cycling, and modelling design. This approach could be integrated with the existing school environmental resources at MTsN 3 Mataram to create more engaging and effective biology learning experiences. Learning environments can foster active, constructive, and interactive learning processes among secondary students, suggesting that combining physical school environmental resources with digital technologies might create synergistic effects in biology education [11].

Furthermore, the broader educational context should be considered. Synthesized five decades of research across 43 countries and found that environmental education significantly improved students' environmental knowledge ($g = 0.953$), attitudes ($g = 0.384$), and behaviors ($g = 0.410$). Given that biology education inherently involves environmental concepts, schools could strategically design their learning environments to serve dual purposes: as physical spaces that support effective learning and as living laboratories that foster environmental awareness and sustainability consciousness among students [7].

Conclusion

Empirical investigations conducted at MTsN 3 Mataram demonstrated a significant positive correlation between the condition of the school environment and the academic achievement of biology students in grade 7. The better the school environment used for learning activities, the more students will improve their learning outcomes. The dimensions of the school environment, which include the school atmosphere, the availability of learning materials, the quality of teacher-student relations, and the dynamics of relationships between students, synergistically contribute to the optimization of learning outcomes, with a correlation coefficient of 0.608, which indicates a strong relationship at a significance level of 5%. These findings imply the importance of holistic attention to all aspects of the learning environment in an effort to improve the quality of biology education at the tsanawiyah madrasah level.

Author's Contributions

E. A. Nathania is responsible for all stages of research, ranging from conceptualization, methodology, data collection, statistical analysis, interpretation of results, to manuscript writing. Mahrus & I.W. Merta: validated the instruments, conducted field surveys, and prepared the final research reports.

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