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# Comparative Analysis of Classroom Management Instruments and Student Learning Motivation Using the Likert Scale

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**ABSTRACT**

**Purpose** – Classroom management and learning motivation are essential components that influence students' engagement and academic success. Although these constructs are closely interconnected, limited studies have comparatively examined students' perceptions of both aspects within the same educational setting. This study aimed to analyze and compare students' perceptions of classroom management and learning motivation in three senior secondary schools in Tempos Village, West Lombok.

**Methodology** – This study employed a quantitative descriptive comparative design. A total of 227 students from MA Fathul Akbar NW Tempos, MA Nurul Huda Tempos, and SMK Hizbunnajah NW Tempos participated in the study. Data were collected using two Likert-scale questionnaires measuring classroom management and learning motivation. Descriptive statistics were used to summarize the data, while the Shapiro–Wilk test examined data normality and Levene's test assessed the homogeneity of variances. All statistical analyses were conducted using R Studio.

**Findings** – The findings showed that students perceived both classroom management and learning motivation positively. The mean classroom management score was 25.59, whereas the mean learning motivation score was 26.59. Learning motivation demonstrated greater variability than classroom management, indicating more diverse student perceptions. The Shapiro–Wilk test revealed that both variables were not normally distributed ($p < 0.05$), while Levene's test indicated homogeneous variances ($p > 0.05$). These findings suggest that effective classroom management should be complemented by strategies that foster students' learning motivation, particularly in educational settings characterized by diverse socio-cultural backgrounds.

**Novelty** – This study provides a comparative analysis of classroom management and learning motivation using the same measurement framework and statistical assumptions, offering empirical evidence of the relationship between classroom climate and students' motivational perceptions.

**Significance** – The findings provide practical insights for teachers, school administrators, and educational policymakers in designing learning environments that effectively integrate classroom management practices with strategies to enhance students' motivation and engagement.

**Keywords:** Classroom management; Comparative analysis; Learning environment; Learning motivation; Likert scale; Quantitative research; Secondary education; Student perception.

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## 1. Introduction

Education not only serves as a means to transfer knowledge, but also as a process of character formation and development of students' potential (Kania et al., 2023). In the context of formal learning in schools, the success of learning is largely determined by two important factors, namely classroom management and student learning motivation (Ahmad, 2021). Good classroom management creates an orderly, comfortable, and supportive learning environment (Mustari & Muhammad, 2023; Sorbeto et al., 2022; Suprianto et al., 2021). On the other hand, learning motivation acts as an internal driver that encourages students to actively engage, survive, and achieve their learning goals (Elshareif & Mohamed, 2021; Tentama et al., 2019). These two aspects can be observed in daily activities in the classroom, especially in the high school environment, both at the high school/MA and vocational levels. In an area like Tempos, West Lombok, where students' backgrounds are diverse in terms of social, economic, and cultural aspects, the challenges in maintaining classroom management and maintaining motivation to learn become increasingly complex.

In the learning process at school, there are still many teachers who face difficulties in creating a conducive classroom atmosphere and motivating students to learn independently and sustainably (Sobral, 2021). Students who are in a poorly organized class tend to experience concentration disorders, lose interest in learning, and even experience decreased achievement (Ateh & Ryan, 2023; Keshavarz et al., 2022). Conversely, students who have low learning motivation will also find it difficult to achieve optimal learning outcomes, even under good classroom management (Cook & Artino, 2016; Elshareif & Mohamed, 2021; Tentama et al., 2019). Therefore, understanding students' perceptions of these two variables is not only important for teachers, but also for school principals, curriculum developers, and other parties interested in improving the quality of education. The results of this study can also be used as a basis for evidence-based policy making in improving the quality of learning.

Although there is a lot of literature that discusses the importance of classroom management and learning motivation separately, there is still little research that explicitly compares students' perceptions of the two within a single, structured quantitative measurement framework. This creates a knowledge gap regarding the extent to which students view both aspects as integral parts of their learning experience. In addition, there are not many measurement instruments that are able to accurately capture students' perceptions of these two aspects at the same time, especially in areas with local characteristics such as in Tempos. With this research, it is hoped that it can contribute to the development of more comprehensive measurement instruments and approaches.

The aim of this study was to analyze and compare students' perceptions of classroom management and learning motivation, using a Likert scale instrument that had been previously validated by experts in previous studies (Ahmad; Taqiudin, 2025). This study not only presents descriptive data such as averages and score distribution, but also evaluates the characteristics of data distribution, variance, normality tests, and homogeneity as a basis for consideration in choosing the right statistical analysis technique. By comparing the two constructs, the researcher seeks to provide a comprehensive picture of which areas are stronger or need to be improved from the student's point of view.

The scope of this research is focused on only two main variables, namely classroom management and learning motivation, as perceived by students. This study did not include external factors such as teachers' teaching methods, family roles, school infrastructure, or individual students' psychological conditions. In addition, this study is limited to the local context in the Tempos region and is not

intended to be generalized to the entire student population in other regions. However, the results of this study are expected to be the basis for the development of further studies and as an initial reflection in developing more effective and contextual learning strategies.

## 2. Methods

This study uses a comparative descriptive quantitative approach with the aim of analyzing and comparing students' perceptions of classroom management and learning motivation using Likert scale-based instruments. The subjects in this study are students from three schools in Dempos Tempos Village, West Lombok Regency, namely MA Fathul Akbar NW Tempos, MA Nurul Huda Tempos, and SMK Hizbunnajah NW Tempos.

The number of respondents in this study was 227 students, sampling was carried out in total sampling, where all students who met the inclusion criteria were involved in the research. The instrument used consists of two parts, namely the Class Management scale (Total_MK) and the Learning Motivation scale (Total_MB), each consisting of 10 statements assessed using a Likert scale of 1–5.

The data analysis process was carried out quantitatively using R Studio, an open-source-based statistical software. The analysis begins with descriptive statistics to look at the distribution of the data, including mean values, standard deviation, median, minimum, maximum, skewness, and kurtosis. Furthermore, normality tests were carried out using the Shapiro-Wilk Test, variance homogeneity tests using Levene's Test, and data visualization in the form of histograms, boxplots, and Q-Q plots. This analysis aims to evaluate the characteristics of the data distribution and equivalence of variance, as a basis for determining appropriate advanced statistical tests (Kronthaler & Zöllner, 2020).

## 3. Results and Discussion

### 3.1. Results

To provide an initial overview of the characteristics of the data, a descriptive statistical analysis was carried out on the scores of Total_MK (Classroom Management) and Total_MB (Learning Motivation). Full details are presented in Table 1 below.

**Table 1 - Descriptive Statistics of Total Scores of MK and MB**

| Variable | N | Red | SD | Median | Min | Max | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|---|
| Total_MK | 227 | 25.59 | 3.73 | 25 | 15 | 35 | -0.06 | -0.31 |
| Total_MB | 227 | 26.59 | 4.25 | 26 | 17 | 37 | 0.34 | -0.54 |

The results of the descriptive analysis in table 1 show that the number of respondents for both variables is the same, namely 227 people. The mean for Total_MK score is 25.59 with a standard deviation of 3.73, while the Total_MB score has an average value of 26.59 with a standard deviation of 4.25. This indicates that the average score on Total_MB is slightly higher and has a slightly larger spread than Total_MK.

The median value of the Total_MK is 25 and the Total_MB is 26, which indicates that the two data distributions are quite symmetrical, since the median and mean values do not differ much. The skewness value for Total_MK is -0.06 and for Total_MB is 0.34. This value of skewness indicates that the distribution of data for Total_MK is almost symmetrical, while Total_MB is slightly skewed to the right (positive). The kurtosis values on both negative variables, respectively -0.31 and -0.54, which indicate that the form of data distribution is more sloping than the normal distribution (platycurtic).

#### *3.1.1. Differences in Data Distribution*

To see the level of data distribution in each construct, variance calculations were carried out on Total_MK and Total_MB scores. Variance indicates the extent to which the data is spread from its

average value; The greater the value of variance, the greater the diversity of scores within the group. Details of the variance value can be seen in Table 2 and Figure 1 below.

**Table 2 -Total Score Variance of MK and MB**

| Variable | Variance |
|---|---|
| Total_MK (Classroom Management) | 13.88 |
| Total_MB (Learning Motivation) | 18.04 |

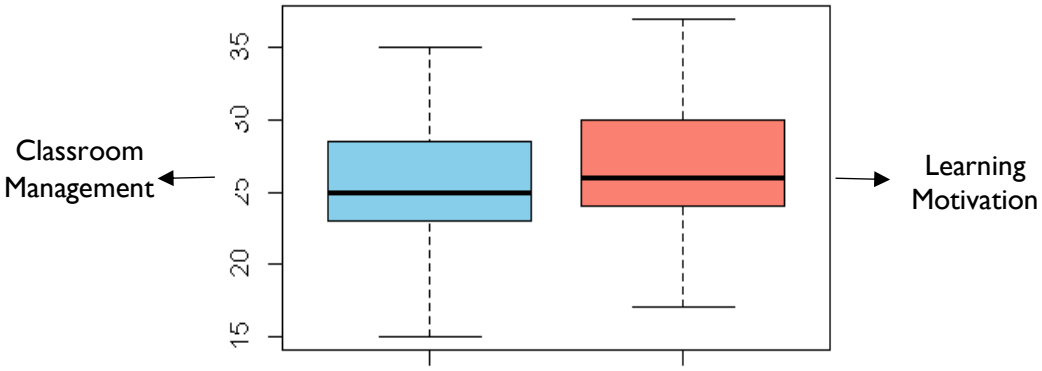


**Figure 1.** Total Score Distribution

The boxplot image of picture 1 shows the distribution of total scores for two variables, namely Classroom Management and Learning Motivation. From the visualization, it appears that the score on the Learning Motivation variable has a slightly wider data distribution compared to Classroom Management. This is also strengthened by the value of variance in table 2, namely the value of each variance Total_MK of 13.88, while the variance of Total_MB is 18.04.

In the boxplot, it can be seen that the median of the two variables is quite close to each other, but the distribution of scores on Learning Motivation is wider, which means there is a greater variation in scores among respondents. The interquartile range (IQR) was also larger on Learning Motivation, indicating that 50% of the middle scores were more dispersed.

### *3.1.2. Differences in Frequency Distribution*

To provide a visual overview of the distribution of score data obtained by students, a frequency distribution analysis was carried out on two main variables, namely Total Class Management (MK) score and Total Learning Motivation (MB) score. This distribution is presented in the form of a histogram to make it easier to interpret the pattern of the spread of the collected values. Through this graph, it can be observed how the tendency of students' scores in each construct, whether they are symmetrically distributed, pressed to the right or to the left, as well as how the level of concentration of respondents in a certain range of values is measured. A visualization of the frequency distribution is shown in Figure 2 below.

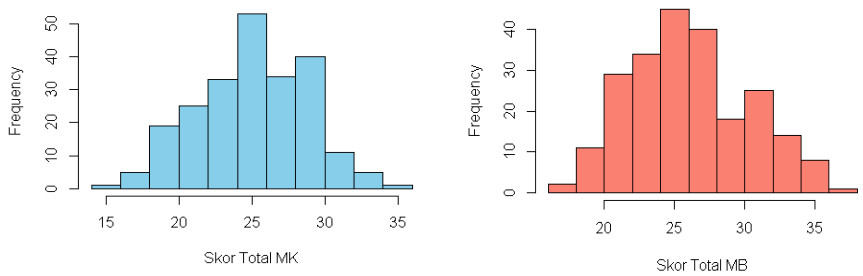


**Figure 2.** Frequency Distribution

Based on the histogram of figure 2, it can be seen that both variables have a relatively close to normal form of distribution, with a concentration of values in the range of scores of 23 to 28. The score that most often appears on the Total_MK is 25 (frequency = 23), while on Total_MB it is 25 and 26 (frequency = 22, respectively). This shows that most respondents obtained moderate to high scores on both variables. The distribution Total_MK tends to be symmetrical, while Total_MB show a slight positive tendency (skewed to the right), as previously shown in the skewness value.

### *3.1.3. Differences in Normality Test*

To find out whether the Total_MK and Total_MB score data are normally distributed, a normality test is carried out using the Shapiro-Wilk Test. This test is used because it is suitable for small to medium sample sizes and is sensitive in detecting deviations from the normal distribution. Based on the test results, both variables showed a p< value of 0.05, which means that the data was not statistically normally distributed. Details of the test results are presented in Table 3 below.

**Table 3 - Shapiro-Wilk Normality Test Results**

| Variable | W | p-value | Conclusion of Normality |
|---|---|---|---|
| Total_MK | 0.98709 | 0.03805 | Abnormal |
| Total_MB | 0.97487 | 0.00046 | Abnormal |

The Shapiro-Wilk normality test performed on the Total_MK and Total_MB score data in table 3 showed that the two variables were not statistically normally distributed. For Total_MK score, the statistical value of W is 0.98709 with a p-value of 0.03805. Since the p-value is less than 0.05, it is concluded that the data is not normally distributed. Meanwhile, in the Total_MB score, the W value was lower at 0.97487 with a p-value of 0.0004571, which is also well below the threshold of 0.05. This suggests that the distribution of learning motivation scores has a more significant deviation from the normal distribution compared to the classroom management score. This is also reinforced by Figure 3 of the normality distribution below.

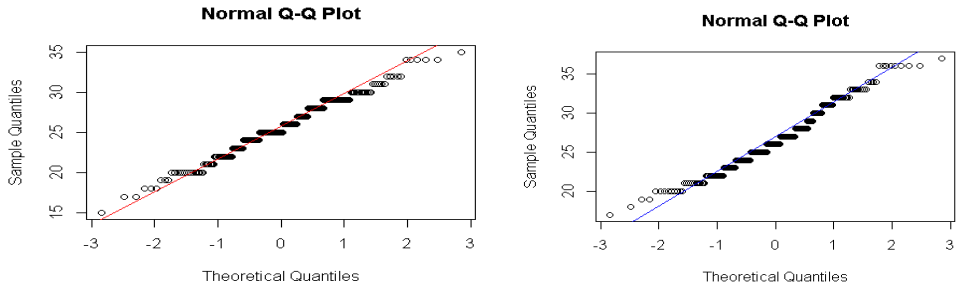


**Figure 3.** Normality Distribution

In figure 3, it can be seen that the data Total_MK, most of the points follow the diagonal line, but deviations begin to be seen in the lower and upper tails. This indicates that the data has a small deviation from normality, especially at extreme values. In the Total_MB data, the deviation of the dots from the diagonal line appeared more pronounced in different parts of the distribution, confirming the results of the Shapiro-Wilk test that the data did not follow the normal distribution.

### *3.1.4. Homogeneity Test Differences*

To test whether the score variance between Total_MK (Class Management) and Total_MB (Learning Motivation) is homogeneous, Levene's Test is used. This test is important to ensure that the assumption of similarity of variance is met before performing a parametric analysis. The test results showed that the p-value > 0.05, so it can be concluded that both groups have homogeneous variance. More details are presented in Table 4 below.

**Table 4 - Results of the Variance Homogeneity Test (Levene's Test)**

| Groups | Df | F Value | p-value | Conclusion |
|---|---|---|---|---|
| Total_MK vs Total_MB | 1 | 3.3402 | 0.06827 | Homogeneous variance (p > 0.05) |

The test results in table 4 show an F value of 3.3402 with a p-value of 0.06827. Since the p-value is greater than 0.05 but still below 0.10, it can generally be concluded that there is no statistically significant difference in variance between the two groups, with a 95% confidence level. This means that the data from both constructs (Classroom Management and Learning Motivation) meet the assumption of variance homogeneity.

#### *3.1.5. Error Standard Differences*

To measure the level of precision of the estimated average score, a standard error (SE) calculation was carried out on each variable, namely Total_MK (Class Management) and Total_MB (Learning Motivation). The error standard describes how much the average value of the sample deviates from the actual value of the population. The smaller the SE value, the higher the average estimated reliability. The SE value is calculated based on the division of standard deviation by the root of the number of respondents. The results of the calculation of the standard error are presented in Table 5 below.

**Table 5 - Standard Total Score Error**

| Variable | Standard Error (SE) |
|---|---|
| Total_MK | 0.2473 |
| Total_MB | 0.2819 |

The calculation of the standard error (SE) in table 5 shows that the SE value for Total_MK score is 0.2473, while for the Total_MB score is 0.2819. The standard error value is calculated based on the standard deviation formula divided by the root of the number of samples (n), which in this case the number of respondents is 227 people for each variable.

### 3.2. Discussions

The difference in average score between Total_MK and Total_MB, although not too large, indicates a difference in respondents' performance in the two types of instruments or aspects measured. The relatively similar standard values of deviation and MAD indicate that the level of variability between respondents is almost equal in both measurements. The range in both is also the same, which is 20, indicating a relatively balanced distribution of minimum and maximum scores. A nearly symmetrical distribution (skewness close to zero) on Total_MK indicates that most of the values are clustered around the mean, while a slightly skewed distribution of Total_MB to the right indicates that there is a small percentage of respondents who score higher than average. This shows that the MB instrument provides a greater chance of obtaining high scores, or that participants are more proficient in the material or context of MB than the MK (Lwande et al., 2021).

#### *3.2.1. Differences in Data Distribution*

The difference in variance between the two variables provides an important indication of the diversity of participants' responses. Higher variance on Learning Motivation scores indicated that participants showed more diverse levels of motivation compared to classroom management skills, which had smaller variances. This may indicate that learning motivation is influenced by more complex and varied factors, such as personal circumstances, family background, and learning environment.

Meanwhile, classroom management as a competency that may be more shaped by specific habits or training, shows a more concentrated distribution of scores. These findings can provide direction for educators or researchers to pay more attention to designing learning interventions or training that target increased learning motivation, with an adaptive approach according to the diversity of students (Rafiola et al., 2020).

### *3.2.2. Differences in Frequency Distribution*

This frequency distribution analysis reinforces previous findings that scores on Learning Motivation are slightly more dispersed and varied compared to Classroom Management. In addition, although the distribution of scores on Learning Motivation is wider (ranging from 17 to 37), the distribution on Class Management is relatively narrower (15 to 35) and more symmetrical.

The high frequency in the middle score range (23-28) indicates that most participants are at a fairly good level of competence, both in terms of classroom management and learning motivation (Lin et al., 2017). However, the presence of respondents with very low or very high scores (e.g. a score of 15 in the Constitutional Court and a score of 37 in MB) indicates a diversity of individual ability levels or conditions that need to be further analyzed, for example with a qualitative or clustering approach.

### *3.2.3. Differences in Normality Test*

The above findings suggest that Total_MK and Total_MB data are not normally distributed have important implications in subsequent statistical analysis. Distribution abnormalities can affect the validity of parametric statistical tests such as t-tests or ANOVAs, which assume the normality of the data. Therefore, if the purpose of the analysis is to compare scores between two groups or test the relationships between variables, it is recommended to use a non-parametric approach, such as the Mann-Whitney test or Spearman correlation.

Although visually the histogram and the previous boxplot show a relatively symmetrical distribution pattern, formal analysis confirms the existence of a statistical deviation from normality. This confirms the importance of not only relying on visualization, but also complementing interpretation with formal statistical tests.

### *3.2.4. Homogeneity Test Differences*

Homogeneity of variance is one of the important assumptions in the use of parametric statistical tests, such as t-tests and ANOVA. In this context, the results of Levene's Test show that although there is a difference in the value of variance between Total_MK (13.88) and Total_MB (18.04), the difference is not statistically significant. A p-value close to the significance limit ($0.05 < p < 0.10$) indicates that the difference in variance between constructs is not strong enough to be considered a violation of the homogeneity assumption (Sianturi, 2022). Thus, it can be concluded that statistically, the assumption of variance homogeneity is met, so that comparative or inferential analyses of a parametric nature can still be performed.

### *3.2.5. Error Standard Differences*

Standard error reflects how much uncertainty or error there is in estimating the population parameters of the sample. In this context, the smaller SE on Total_MK suggests that the estimated average grade management score is more stable and less varied compared to Total_MB. In contrast, a larger SE in Total_MB reflects that there is slightly more uncertainty in the average learning motivation score.

These SE values also support previous findings that show that variance in Total_MB is higher than in Total_MK. Thus, in the presentation of data or the creation of confidence intervals, Total_MK have more precise averages, while Total_MB have a wider spread of average estimates, which need to be taken into account in the interpretation of results and decision-making.

## 4. Conclusions

Based on the results of the analysis of student perception data from 227 respondents at MA/MTs Fathul Akbar NW Tempos, MA/MTs Nurul Huda Tempos, and SMK/SMP Hizbunnajah NW Tempos, it can be concluded that both classroom management (Total_MK) and learning motivation (Total_MB) have an important role in supporting learning success. The average score of Total_MK is 25.59 with a

standard deviation of 3.73, while the Total_MB score is slightly higher at 26.59 with a standard deviation of 4.25. In terms of data dissemination, the variance in Total_MK was 13.88 and 18.04 in Total_MB, showing that students' perceptions of learning motivation were more diverse than perceptions of classroom management. The distribution of Total_MK scores tended to be symmetrical with a skewness value of -0.06 and kurtosis -0.31, while Total_MB showed a slight tendency of positive distribution with a skewness of 0.34 and kurtosis of -0.54. The results of the normality test using Shapiro-Wilk indicated that the two data were not statistically normally distributed, with p-values of 0.03805 for Total_MK and 0.00046 for Total_MB. However, the variance homogeneity test using Levene's Test showed that the two groups had relatively equivalent variance with a p-value of 0.06827. In addition, the standard error of each variable is 0.2473 for Total_MK and 0.2819 for Total_MB, indicating that the average estimate is quite stable. These findings underscore that although both aspects are equally perceived positively by students, learning motivation tends to vary more varied, so more attention needs to be paid to its design. This conclusion provides the basis that learning strategies in schools, especially in educational units in semi-urban areas such as Tempos, need to pay attention to the balance between classroom management and efforts to increase learning motivation systematically and contextually.

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## Conflict of Interest

The author states that there is no conflict of interest in the research or writing of this article. The entire research process is carried out independently without any influence from any party that can affect the results or interpretation of the research.

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