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Comparative Analysis of Social Media Usage Duration Among Vocational High School Students Using A Data Analytics Approach

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Abstract

This study aims to analyze and compare the duration of social media usage among Vocational High School (SMK) students in Parepare City, specifically at SMKN 2 and SMKN 3, using a quantitative analytical approach based on descriptive and inferential statistics. The study involved 100 students who were randomly selected from both schools. The primary data in the form of the duration of social media usage were obtained from screen time records on students' smartphones for three consecutive days, while a Likert-scale questionnaire was used as supporting data to describe patterns and tendencies of usage. Data analysis included descriptive statistics, an independent t-test to compare the duration of usage between schools, and a one-way ANOVA test to examine differences in duration among social media platforms. The results of the analysis showed that there was no significant difference in the duration of social media usage between students of SMKN 2 and SMKN 3 ($p > 0.05$). However, there was a significant difference among platforms ($p < 0.001$), with TikTok as the dominant platform with an average of 436.4 minutes over three days, followed by WhatsApp (345.4 minutes), Instagram (264.0 minutes), and YouTube (185.0 minutes). The average duration of students' social media usage reached approximately 6–7 hours per day, which is relatively higher compared to national reports. This comparison is indicative considering the differences in platform definitions and measurement methods. The findings of this study indicate the need for digital literacy assistance in the school environment so that social media usage can be managed more wisely and does not negatively affect the students' learning process.

Keywords: Social Media; Usage Duration; Vocational High School Students; Data Analytics; ANOVA.

Introduction

Social media has become one of the most widely used digital technologies among Vocational High School (SMK) students in their daily lives. Platforms such as Instagram, TikTok, WhatsApp, and YouTube are not only used as means of communication, entertainment, and information seeking, but also as informal learning media that support students' academic and non-academic activities. In the context of education, the use of social media can provide various benefits, including supporting skill development, career preparation, and students' economic empowerment. In addition, social media has also been used internationally as a data source to conduct analysis and prediction of users' psychological conditions. [1], [2], [3]. As the use of social media in students' lives continues to increase, understanding how social media usage behavior is measured becomes an important aspect to consider in educational research.

Social media user behavior is generally understood through patterns, frequency, and duration of interaction with digital platforms. Therefore, measuring usage duration becomes one of the main indicators to describe the intensity of social media use. Several studies show that duration data obtained through user self-reports often do not fully reflect actual behavior, as they are influenced by memory limitations and respondents' subjective perceptions. To overcome these limitations, the use of direct usage duration data from devices, such as the screen time feature on smartphones, has been widely applied as a more objective and continuous approach to measuring social media usage behavior [4], [5], [6]. In this study, questionnaire data are used as supporting information to describe user characteristics and usage habits, while the main analysis focuses on social media usage duration data.

Uncontrolled social media usage, especially through smartphones, has the potential to create various problems in the educational context. When students become more interested in using social media than engaging in formal learning processes, the resulting impact is not only a decline in learning quality but also obstacles to the development of students' skills as well as their academic and non-academic achievements [7], [8], [9]. The phenomenon of increasing intensity and duration of social media use raises particular concerns, especially when it is not balanced with proper time management [10].

Several studies indicate that excessive social media use can negatively affect learning concentration, mental health, anxiety levels, academic productivity, and students' learning motivation [11], [12], [13]. However, the study found that although most students own and use smartphones, their social behavior remains generally positive. However, several challenges persist, particularly with regard to low levels of discipline. These findings suggest that the impact of social media use is not uniform but rather depends on the patterns, intensity, and manner in which students engage with social media.

In the long term, social media use also has the potential to reduce face-to-face social interactions, as students tend to communicate more frequently through social media than in real-life settings. This situation makes uncontrolled smartphone and social media use a significant challenge for the education sector. Therefore, analyzing the duration and patterns of social media usage becomes important to understand students' behavior, their level of engagement with particular platforms, and the potential impact on students' productivity and well-being.

In the context of vocational high school students in Indonesia, particularly in schools where technological facilities are gradually developing, research related to social media use is still largely dominated by general descriptive approaches and mostly discusses the impacts of its use. For example, a study conducted by Fitri entitled "The Influence of Smartphone Use on the Learning Interest of Students at SMK Negeri 1 Tasikmalaya" focuses on the relationship between smartphone use and students' learning interest, without examining the duration of social media use in detail based on the platforms used. Another study by Itna entitled "The Influence of Social Media Usage on Learning Interest (Analysis of Students at SMK Muhammadiyah Sekampung and MAN 1 Metro" also focuses on the influence of social media use on the learning interest of students in SMK and MAN, using a descriptive survey approach that emphasizes the impact aspect rather than the pattern of usage duration across platforms.

Although these studies provide an initial overview of the implications of social media use in the educational context, studies that specifically compare the duration of social media use based on different platforms and objective screen time data, particularly in different school environments, are still relatively limited. In addition, the use of social media usage duration data as a basis for analyzing student behavior has not been widely explored in depth. Comparisons between schools are relevant because differences in learning environments, student characteristics, and school culture may influence patterns of social media use. Therefore, this study attempts to fill this gap by analyzing and comparing the duration of the use of several popular social media platforms among students of SMKN 2 Parepare and SMKN 3 Parepare.

Based on this background, the research questions proposed in this study are how the patterns of usage duration of several social media platforms appear, whether there are significant differences between the usage duration of each platform, and what factors influence the intensity of social media use among students of SMKN 2 Parepare and SMKN 3 Parepare.

Method

This study employed a descriptive quantitative approach with a comparative cross-sectional design to analyze the duration of social media usage among students of SMKN 2 and SMKN 3 Parepare within a specific observation period. The research population consisted of all twelfth-grade students from both schools in the current academic year. The selection of twelfth-grade students was based on the consideration that students at this level have relatively stable experience in using smartphones and social media, as well as a more consistent level of digital independence compared to students in lower grades.

The sampling frame was obtained from the official list of twelfth-grade students provided by the schools. From this population, a sample of 100 respondents was selected using a simple random sampling technique

with the assistance of a numerical randomization function in spreadsheet software, ensuring that each student had an equal opportunity to be selected. The sample consisted of 50 students from each school. The inclusion criteria in this study included active twelfth-grade students, ownership of a personal smartphone based on Android or iOS, having an active screen time feature or application usage history, and willingness to provide screenshots of usage data as part of the verification process. Respondents who did not meet these criteria or did not complete the data according to the observation period were excluded from the final analysis.

Data collection was conducted on school days (weekdays) for three consecutive days during a regular learning week and not during examination periods or special school activities, in order to minimize bias in usage variation that typically increases during weekends or specific periods. The research instrument consisted of a questionnaire with 35 statement items using a five-point Likert scale. This instrument was developed to measure several dimensions of social media usage behavior, namely: (1) access frequency, (2) platform preference, (3) usage purpose (academic/non-academic), and (4) self-control in usage. The selection of usage duration analysis was based on previous studies indicating that the intensity and duration of social media usage are associated with students' academic performance and well-being [14], [15], [16].

The data used in this study consisted of two types: questionnaire data and social media usage duration data obtained from the screen time feature on respondents' smartphones. The questionnaire data were used to obtain information regarding students' social media usage habits, while the screen time data were used as the primary data to analyze the duration of usage of social media applications such as YouTube, TikTok, Instagram, and WhatsApp.

Before the questionnaire data were used in the analysis process, a validity test was first conducted to ensure that each item in the questionnaire was able to accurately measure the variables under study. The validity test was carried out using the Pearson Product Moment correlation method between the score of each question item and the total score of the respondents [17], [18]. Mathematically, the Pearson correlation coefficient is expressed by the following equation:

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}} \quad (1)$$

where r represents the correlation coefficient, x is the score of the question item, y is the total score of the respondents, and n is the number of samples. A question item is considered valid if the calculated correlation coefficient r is greater than the value of r in the table at a certain level of significance.

In addition to the validity test, the questionnaire instrument was also tested for reliability to determine the level of consistency of the research instrument. The reliability test was conducted using the Cronbach's Alpha method, which is used to measure the internal consistency of a research instrument. The Cronbach's Alpha equation is expressed as follows:

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum s_i^2}{s_t^2}\right) \quad (2)$$

where α represents the reliability coefficient, k is the number of question items, s_i^2 is the variance of each item, and s_t^2 is the total variance. The research instrument is considered reliable if the Cronbach's Alpha value is greater than 0.70, indicating that the instrument has a good level of consistency and can be used in the study.

After the questionnaire instrument was declared valid and reliable, the next stage was the collection of social media usage duration data using the screen time feature on respondents' smartphones. The data were collected through documentation of screenshots showing the duration of usage of each social media application for three consecutive days during school days. The use of screen time data was chosen because it can provide more objective information about application usage activities compared to the self-report method, which relies on respondents' memory.

The obtained social media usage duration data were then analyzed using descriptive statistics to describe the characteristics of the research data. Descriptive statistics were used to determine the average value (mean), data distribution, and patterns of social media usage across each platform. The mean value was calculated using the following equation:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \tag{3}$$

where $\bar{x}$ represents the mean value, x_i is the i-th observation value, and n is the number of observations.

Before conducting further statistical analysis, the data were first tested for normality to ensure that the assumptions of parametric tests were met and to determine whether the data distribution followed a normal distribution [19]. The normalization process in data visualization was carried out using the Min–Max Normalization method. Min–Max is a data normalization method that transforms the range of values of a variable into a specific scale. The use of this method is expressed by the following equation, where x and x' represent the data before and after normalization, respectively [20].

The normality test on the screen time results was conducted to determine the appropriate statistical analysis method in this study. If the data were not normally distributed, data transformation was performed using the Box-Cox Transformation method to improve the data distribution so that it approached a normal distribution [21], [22], [23]. The Box-Cox transformation is expressed by the following equation:

$$y(\lambda) = \begin{cases} \dfrac{y^{\lambda} - 1}{\lambda}, & \lambda \neq 0 \\ \ln(y), & \lambda = 0 \end{cases} \tag{4}$$

This transformation is used to stabilize variance and improve the suitability of the data distribution with the normality assumption.

After the data met the normality assumption, the next step was to conduct a homogeneity of variance test to ensure that the variances among data groups were equal. The homogeneity test was performed using Levene's test, which is used to test the equality of variances between two or more data groups [24], [25]. If the significance value is greater than 0.05, it can be concluded that the variances among groups are homogeneous, allowing parametric statistical analysis to be conducted.

$$W = \frac{(N-k)}{(k-1)} \cdot \frac{\sum_{i=1}^{k} n_i \, (\bar{Z}_{i.} - \bar{Z}_{..})^2}{\sum_{i=1}^{k} \sum_{j=1}^{n_i} (Z_{ij} - \bar{Z}_{i.})^2} k \tag{5}$$

k represents the number of groups being compared, N is the total number of observations or samples, and n_i is the number of samples in the i-th group. Furthermore, Z_{ij} represents the absolute deviation of the original data from the group mean $\left(| \, Y_{ij} - \bar{Y}_{i.} \, |\right)$, $\bar{Z}_{i.}$ is the mean value of Z in the i-th group, and $\bar{Z}_{..}$ is the overall mean value of Zacross all samples.

To determine the difference in the average duration of social media usage between students of SMKN 2 Parepare and SMKN 3 Parepare, this study used the Independent Sample t-Test. This test is used to determine whether there is a significant difference between two sample means [26]. The statistical equation of the t-test is expressed as follows:

$$t = \frac{\bar{x_1} - \bar{x_2}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \tag{6}$$

where $\bar{x}_1$ and $\bar{x}_2$ represent the mean values of each group, s_1^2 and s_2^2 represent the variances of each group, and n_1 and n_2 represent the number of samples in each group.

In addition, to determine the differences in usage duration among social media platforms, this study also employed a one-way analysis of variance (One-Way ANOVA). This method is used to test an experimental design involving more than two independent groups [27], [28]. The ANOVA test statistic is expressed by the following equation:

$$F = \frac{MS_{between}}{MS_{within}} \tag{7}$$

where $MS_{between}$ represents the variance between groups and MS_{within} represents the variance within groups. If the significance value is less than 0.05, it can be concluded that there is a significant difference in the mean values among the analyzed data groups. The One-Way ANOVA test can be applied when the required assumptions are met, namely that the data are normally distributed, the variances are homogeneous, and the samples are randomly selected [29], [30].

If the results of the ANOVA test indicate a significant difference among groups, the analysis is continued with a post hoc test using the Tukey Honestly Significant Difference (Tukey HSD) method. The Tukey HSD test is used to determine specifically which pairs of groups have significantly different mean values after the ANOVA test has been conducted [31], [32], [33].

Mathematically, the Tukey HSD test statistic is expressed as follows:

$$HSD = q\sqrt{\frac{MS_{within}}{n}} \tag{8}$$

q represents the value from the studentized range distribution, MS_{within} represents the mean square within value obtained from the ANOVA analysis, and $n$represents the number of samples in each group. If the difference between group means is greater than the HSD value, it can be concluded that the pair of groups has a statistically significant difference in their mean values.

All data processing and analysis procedures in this study were conducted using statistical software to ensure the accuracy of calculations and to facilitate the interpretation of the analysis results. The results of the analysis were then used to identify patterns of students' social media usage and to compare the duration of social media use between students from the two schools that served as the research objects.

Results and Discussion

A. Exploration and Data Collection

Verification was conducted by requesting respondents to provide screenshots of their smartphone screen time records. This step was voluntary (optional) and was intended to enhance the accuracy of the data regarding the duration of social media usage. Consequently, the collected data did not rely solely on students' self-reported responses but were also supported by objective evidence obtained from device usage records. The integration of these two approaches enriched the dataset while simultaneously reducing potential biases that might arise if respondents relied exclusively on memory or subjective perceptions.

At this stage, the researchers performed a preliminary examination of the completeness and consistency of the collected data. Each entry was carefully reviewed to ensure that there were no duplicate submissions, missing responses, or answers that were inconsistent with the questionnaire's rating scale. Subsequently, all data were stored in a structured spreadsheet format to facilitate further processing using descriptive quantitative data analysis techniques.

B. Data Pre-processing

The data pre-processing stage was conducted to ensure that the questionnaire data were properly prepared for subsequent analysis with a high level of accuracy and reliability.

1. Questionnaire Data Cleaning

After the data had been collected from respondents at SMKN 2 Parepare and SMKN 3 Parepare, the first step involved examining the completeness and consistency of the questionnaire responses. During this stage, the researchers removed non-numeric variables, such as respondents' names, to retain only quantitative data in the form of Likert scale scores ranging from 1 to 5. This procedure aimed to facilitate data processing and to minimize potential bias that could arise from the inclusion of non-numerical information.

2. Questionnaire Validity Testing

Subsequently, the validity of the questionnaire items was examined using item–total correlation analysis. The results indicated that most questionnaire items demonstrated correlation coefficients above 0.30 and were

therefore considered valid. However, several items showed relatively low correlations, such as Q1 (0.293). Overall, these findings suggest that the instrument was generally capable of measuring the intended construct, although certain items with lower validity require further consideration.

In addition, the reliability of the instrument was assessed using Cronbach's Alpha coefficient. The analysis yielded a Cronbach's Alpha value of 0.909, which falls into the very high reliability category. This result indicates that the questionnaire instrument possessed strong internal consistency and could therefore be considered reliable for measuring the intensity and patterns of students' social media usage.

3. Normalization and Homogeneity of Usage Duration Data

Based on the initial analysis using the Shapiro–Wilk test, it was found that the data for all platforms (YouTube, TikTok, Instagram, and WhatsApp) were not normally distributed due to the presence of zero values and significant outliers. To address this issue, the researchers applied the Box–Cox transformation as an advanced data processing technique.

The transformation successfully improved the distribution of the data so that the normality assumption was satisfied, particularly for YouTube ($p = 0.584$), TikTok ($p = 0.188$), and Instagram ($p = 0.514$). In addition to testing normality, the homogeneity of variances was examined using Levene's Test to detect potential heterogeneity among groups. The test produced a significance value of $p = 0.063$ ($p > 0.05$), indicating that the variances among the groups of platform usage data were homogeneous.

With the normality assumption satisfied through the Box–Cox transformation and the homogeneity assumption fulfilled, the data distribution became more standardized and suitable for subsequent descriptive and comparative analyses. Overall, this data preprocessing stage successfully produced a dataset that was clean, valid, reliable, and standardized, making it appropriate for use in the following stages of analysis. Through these procedures, the researchers ensured that the conclusions drawn would accurately reflect the patterns of social media usage among vocational high school students in an objective manner.

C. Analysis and Evaluation of Usage Duration Data

Data analysis and evaluation serve to transform raw data into meaningful information required to address the research objectives or research questions, as well as to provide interpretation of the statistical results. Through analysis, the collected data were processed into statistical measures such as means, comparisons, and significance tests to reveal relevant patterns and differences. Meanwhile, evaluation ensured that the obtained results were consistent, valid, and scientifically accountable.

1. Independent Sample t-Test

Based on the results of the independent sample t-test conducted on each social media platform (YouTube, TikTok, Instagram, and WhatsApp), the significance values (p-values) were found to be greater than 0.05. This result indicates that there was no statistically significant difference in the duration of social media usage between students of SMKN 2 Parepare and SMKN 3 Parepare.

In other words, the patterns of social media usage among students from the two schools were relatively similar. This finding suggests that the school factor did not have a significant influence on the amount of time students spent accessing social media, indicating that students' digital habits in both schools tended to be comparable.

Although descriptive statistics showed slight differences in the average duration of usage, these differences were not large enough to be considered statistically significant. This may be attributed to relatively high individual variability within each group.

2. One-Way ANOVA Test

The results of the analysis showed an F-value of 130.28 with $p < 0.001$, indicating a statistically significant difference in usage duration across social media platforms. The average total duration of use over three days was as follows: TikTok accounted for 436.4 minutes (35.5%), WhatsApp for 345.4 minutes (28.1%), Instagram for 264.0 minutes (21.4%), and YouTube for 185.0 minutes (15.0%).

The One-Way ANOVA results yielded $F = 130.28$, $p < 0.001$, with a large effect size ($\eta^2 = 0.494$). This finding indicates that the type of social media platform contributed 49.4% of the variance in students' usage duration. A post hoc analysis using the Tukey HSD test revealed that TikTok had a significantly higher usage duration compared to WhatsApp, Instagram, and YouTube ($p < 0.001$).

The largest mean difference was observed between TikTok and YouTube, with a gap of 251.39 minutes during the three-day observation period.

These results indicate that TikTok was the platform that consumed the greatest amount of students' time, with an average usage of nearly 2.5 hours per day. WhatsApp ranked second as the primary communication platform, with an average usage of approximately 2 hours per day. Instagram occupied the third position, with an average duration of about 1.5 hours per day, while YouTube ranked last, with an average usage of approximately 1 hour per day.

3. Data Visualization

To clarify the research findings and facilitate a better understanding of students' social media usage patterns, the analyzed data were presented not only in tabular form but also through graphical and diagrammatic visualizations. These data visualizations were intended to provide a more intuitive representation of the questionnaire results, highlighting differences in the average duration of usage across platforms as well as the proportional distribution of time spent by students on each platform.

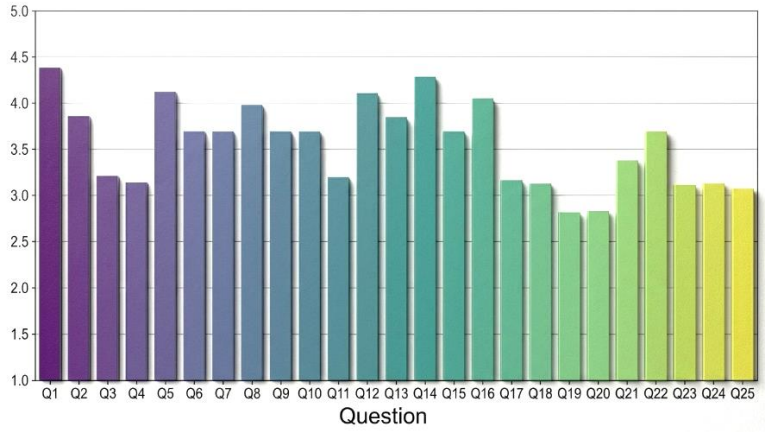

Figure 1. Average Questionnaire Scores

Respondents demonstrated a very high intensity of social media usage. Daily use (Q1) received the highest score of 4.38, indicating that the majority of vocational high school students almost never skip accessing social media. Regarding dependence (Q4), the score for anxiety when not accessing social media was 3.14, suggesting a moderate-to-high level of dependence.

Platform preference, based on the questionnaire's motivation items, showed that although TikTok had the highest usage duration in minutes, Instagram received the highest score for feature attractiveness.

Table 1. Interpretation of Social Media Usage

Platform	Average Questionnaire Score	Interpretation
Instagram (Q8)	3.97	Visual features (Story/Reels) are highly preferred.
TikTok (Q6)	3.69	Short-form content is considered entertaining.
YouTube (Q7)	3.69	Primarily used for long educational videos.
WhatsApp (Q9)	3.69	Considered effective for communication.

Psychological impact and self-control aspects revealed the following: Mental fatigue (Q21) scored 3.37, indicating that many students felt mentally tired after using social media, Social comparison (Q19 & Q20) scored 2.82, meaning some students experienced pressure by comparing their lives to others, although it did

not dominate the entire sample, Postponing study for social media use (Q24 & Q25) scored 3.12, reflecting a tangible impact on productivity.

Conversely, students also experienced significant benefits: Access to up-to-date information (Q14) scored 4.28 (Very High), showing that students heavily relied on social media for news and trends. Friendship and social connection (Q16) scored 4.05, indicating that social media effectively maintained their social ties.

Table 2. Average Social Media Usage Duration Over 3 Days

Platform	Average Duration (3 days)	Percentage (%)
YouTube	185.0 minutes	15.0
TikTok	436.4 minutes	35.5
Instagram	264.0 minutes	21.4
WhatsApp	345.4 minutes	28.1

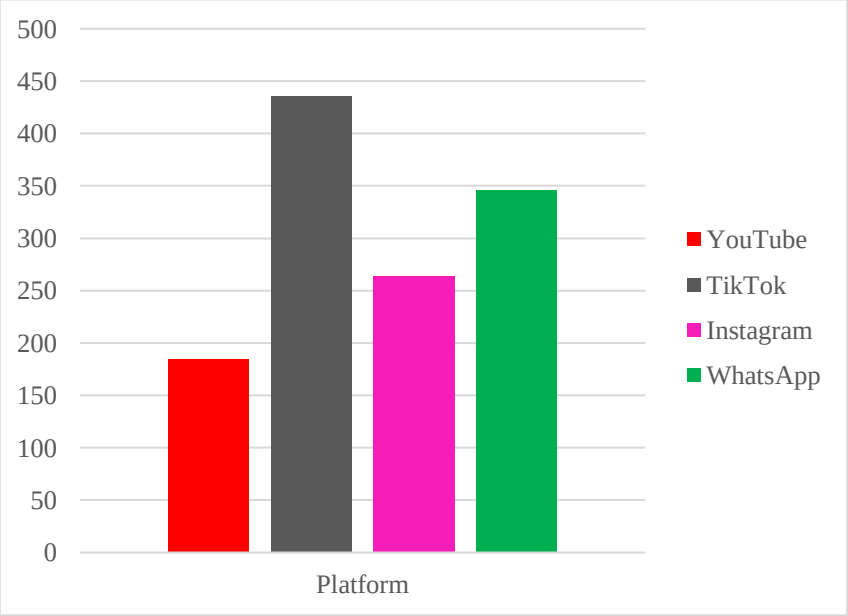

Figure 2. Average Duration of Social Media Usage by Vocational High School Students in (3 days)

The combined analysis revealed that vocational high school students spent the most time on TikTok, with an average total duration of 436.4 minutes (35.5%) over three days. This finding establishes TikTok as the most dominant platform, reflecting students' strong interest in short, interactive entertainment content. The second most used platform was WhatsApp, with an average of 345.4 minutes (28.1%) over three days, highlighting its role as the primary communication tool among students for both social and school-related activities. Instagram also accounted for a substantial portion of usage, averaging 264 minutes (21.4%) over three days, indicating that visual interactions such as sharing photos, stories, and videos remain an important part of students' digital activities. Meanwhile, YouTube ranked last, with an average of 185 minutes (15.0%) over three days, suggesting that students consume long-form video content less frequently compared to short-form content on other platforms. The following table presents the average daily usage for each platform over the three-day period.

Table 3. Average Daily Social Media Usage Over 3 Days

Platform	Day 1	Day 2	Day 3
YouTube	67.3 minutes	71.2 minutes	46.5 minutes
TikTok	169.0 minutes	140.4 minutes	127.0 minutes

Platform	Day 1	Day 2	Day 3
Instagram	90.3 minutes	92.0 minutes	81.7 minutes
WhatsApp	105.0 minutes	109.9 minutes	130.5 minutes

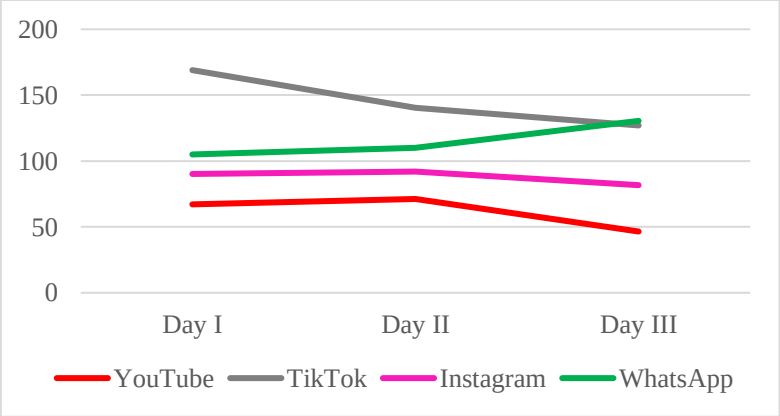

Figure 3. Average Comparison of Social Media Usage in 3 Days

The daily analysis revealed variations in students' social media usage patterns. TikTok consistently ranked first each day, with the highest average usage on Day 1 at 169 minutes, followed by a decrease to 140.4 minutes on Day 2 and 127 minutes on Day 3. This trend indicates that although TikTok's popularity remains high, the intensity of usage tends to decline over consecutive days.

In contrast, WhatsApp exhibited a consistent upward trend, increasing from 105 minutes on Day 1 to 109.9 minutes on Day 2, and peaking at 130.5 minutes on Day 3. This pattern suggests that this communication application is increasingly used for both social interactions and school-related activities.

Instagram usage remained relatively stable during the first two days (approximately 90 minutes) and slightly decreased on Day 3 (81.7 minutes), indicating minimal fluctuation in engagement. Meanwhile, YouTube showed the lowest usage across all platforms, ranging from 67.3–71.2 minutes on Days 1–2, before declining significantly to 46.5 minutes on Day 3. This trend reinforces previous findings that students prefer short, interactive content over long-form videos.

When calculated as a proportion of total daily time (24 hours or 1,440 minutes), the average usage was as follows: TikTok at 145.5 minutes (10.1%), WhatsApp at 115.1 minutes (8.0%), Instagram at 88.0 minutes (6.1%), and YouTube at 61.7 minutes (4.3%). Overall, these four platforms accounted for approximately 28.5% of a 24-hour day, equivalent to around 6.8 hours of daily usage.

Table 4. Percentage Comparison of Daily Social Media Usage (24 hours / 1,440 minutes)

Platform	Minutes/Day	% of 24 Hours
TikTok	145.5	10.1
WhatsApp	115.1	8.0
Instagram	88.0	6.1
YouTube	61.7	4.3
Total (4 Platforms)	410.3	28.5

To examine whether there were differences in social media usage patterns between schools, a comparison was conducted between students of **SMKN 2 Parepare** and **SMKN 3 Parepare**. This analysis aimed to determine whether the **average duration of usage for each platform differed** visually.

Table 5. Social Media Usage Comparison Between SMKN 2 and SMKN 3 Parepare (3 Days)

Platform	SMKN 2 Parepare	SMKN 3 Parepare
YouTube	170.0 minutes	200.1 minutes

Platform	SMKN 2 Parepare	SMKN 3 Parepare
TikTok	420.4 minutes	452.4 minutes
Instagram	250.7 minutes	277.3 minutes
WhatsApp	303.0 minutes	387.8 minutes

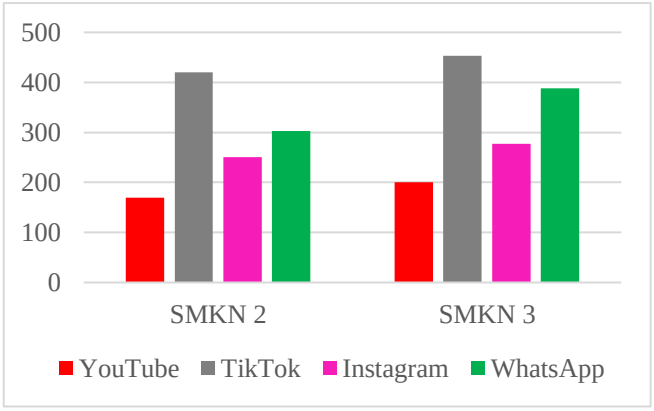

Figure 4. Comparison of social media usage at SMKN 2 and SMKN 3 Parepare

Based on the comparison of average social media usage over three days among 50 respondents from SMKN 2 Parepare and 50 respondents from SMKN 3 Parepare, it was observed that SMKN 3 consistently exhibited higher average usage across all platforms.

On YouTube, the average usage of SMKN 3 students was 200.1 minutes, approximately 30 minutes higher than SMKN 2, which averaged 170 minutes. For TikTok, the dominant platform in both schools, SMKN 3 reached 452.4 minutes, surpassing SMKN 2 by around 32 minutes (420.4 minutes). On Instagram, students from SMKN 3 used the platform for an average of 277.3 minutes, approximately 27 minutes more than their SMKN 2 counterparts (250.7 minutes).

The most notable difference was observed on WhatsApp, where SMKN 3 recorded 387.8 minutes, compared to 303 minutes for SMKN 2, resulting in a gap of nearly 85 minutes.

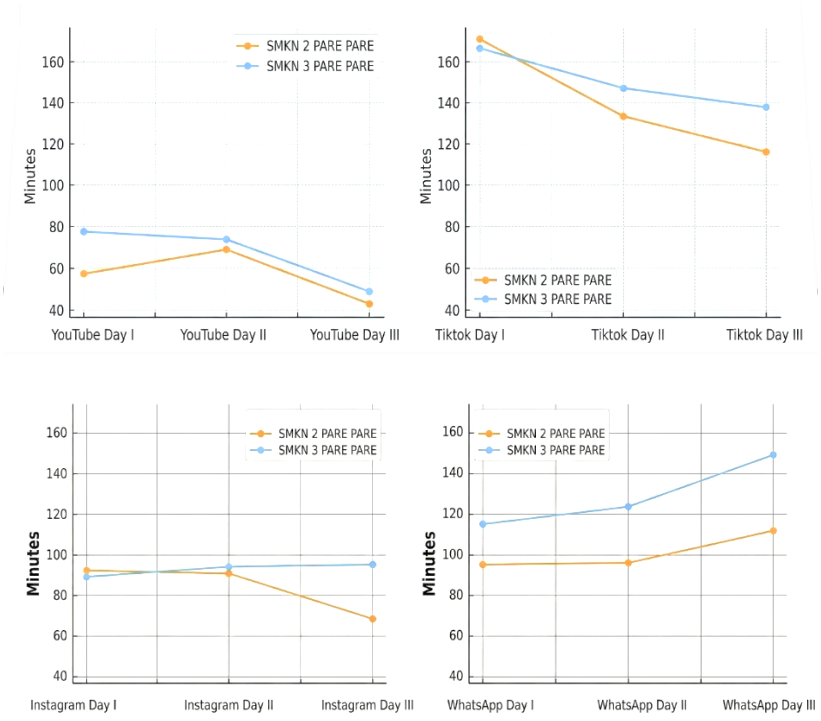

Figure 5. Comparison of social media usage by SMKN 2 and SMKN 3 Parepare on different platforms

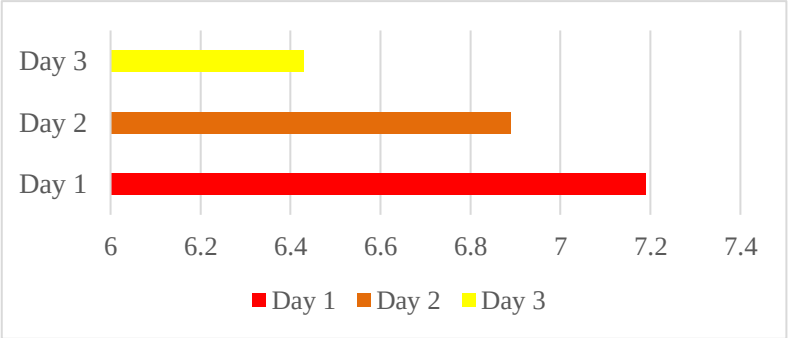

Figure 6. Social media usage of vocational school students in 3 days

Based on the processed data, vocational high school students in Parepare (combining SMKN 2 and SMKN 3, total of 100 respondents) spent an average of approximately 6–7 hours per day on social media. The detailed daily averages were 7.19 hours on Day 1, 6.89 hours on Day 2, and 6.43 hours on Day 3. These findings indicate that over the three-day period, students consistently dedicated more than one-quarter of their day interacting with social media. The most dominant platforms were TikTok (for entertainment and short-form content) and WhatsApp (for communication), while YouTube ranked the lowest in usage.

D. Interpretation of Analysis Results

This study aimed to analyze the duration patterns of social media usage among students of SMKN 2 and SMKN 3 Parepare, compare usage intensity across platforms, and examine significant differences in usage duration. Based on the processed data and statistical analyses, several key findings can be interpreted as follows:

1. Overall Usage Intensity

The daily usage of 6–7 hours indicates a high level of engagement in students' digital activities. However, comparisons with national reports should be interpreted cautiously. According to the We Are Social & Hootsuite report (2024), the average Indonesian spends approximately 3 hours 5 minutes per day on social media [34]. In this study, measurements focused specifically on four major platforms—YouTube, TikTok, Instagram, and WhatsApp—whereas national reports typically encompass a broader range of platforms. Therefore, the difference in figures should not be interpreted as claiming that Parepare vocational students use social media twice the national average, but rather that the dominant platforms already reach or exceed the general national usage average.

These findings are consistent with the results of the questionnaire. Many students reported losing track of time while using social media and remaining active even on school days. Factors such as study schedules, school assignments, and occasional content fatigue may explain the slight decrease in usage observed on Days 2 and 3. Platforms with rapid, short-form content like TikTok continued to drive high initial usage, whereas communication apps such as WhatsApp remained stable or even showed increased usage due to their functional nature. These phenomena are considered typical among vocational high school students for several reasons. First, adolescent characteristics play a role: students aged 15–18 are the most active age group on social media for entertainment, social interaction, and self-exploration. Second, WhatsApp is frequently used for school tasks, class coordination, and peer communication. Third, students enrolled in technology- and multimedia-based programs, such as Computer and Network Engineering (TKJ) and Media Production, are accustomed to, and often required to, interact with digital media on a regular basis. While over six hours of daily social media use is relatively high compared to the national average, it is understandable in the context of vocational high school students due to age, digital culture, and academic or program-specific demands. Nevertheless, such intensity requires digital literacy guidance and time management, to prevent interference with learning and students' mental health.

2. Differences Across Platforms

ANOVA results revealed significant differences in usage duration across social media platforms. Based on average usage, TikTok emerged as the platform with the highest duration (436.4 minutes or 35.5% of total

time), followed by WhatsApp (345.4 minutes or 28.1%), Instagram (264.0 minutes or 21.4%), and YouTube (185.0 minutes or 15.0%). These findings indicate that students tend to spend more time on platforms with short, engaging, and interactive content, compared to platforms focused on communication or long-form videos. This pattern also reflects that adolescents with higher digital engagement show increased intensity in social media usage [35].

3. Implications for Research Objectives

In line with the research objectives, the results demonstrate that students' social media usage is strongly oriented toward fast, entertainment-focused platforms. WhatsApp remains essential for daily communication, while Instagram and YouTube occupy smaller portions of usage time. Therefore, it can be concluded that students primarily utilize social media as a tool for entertainment and rapid communication, rather than for educational or learning purposes.

Conclusion

This study analyzed the comparison of social media usage duration among students of SMKN 2 and SMKN 3 Parepare using a data analytics approach. The findings indicate that the average daily social media usage of students ranges from 6 to 7 hours, nearly twice the national average. The independent sample t-test revealed no significant difference between the two schools, suggesting that students' digital habits are relatively uniform. However, one-way ANOVA indicated significant differences across platforms. TikTok emerged as the dominant platform, with an average usage of 436.4 minutes (35.5%), followed by WhatsApp, Instagram, and YouTube.

Based on these findings, schools are encouraged to implement structured and practical digital guidance strategies. This may involve integrating digital literacy modules into academic subjects or character-building activities, as well as establishing policies to limit device usage and notifications during instructional hours. Schools can also provide programs for digital time management education, helping students balance social media use with academic responsibilities. In addition, engaging parents through digital parenting programs can enhance supervision and communication about social media use at home. The objective of these initiatives is not to restrict social media usage entirely, but rather to guide students in managing their usage proportionally, understanding the risks of content exposure, and using social media productively and responsibly. In this approach, social media is not framed as forbidden, but rather as a tool whose use should be controlled and optimized for both educational and personal benefits.

This study has several limitations. First, the data collection period was limited to three weekdays, which may not fully represent long-term usage patterns. Second, screen time verification via screenshots was voluntary, introducing potential self-report bias for some respondents. Third, the study did not specifically measure demographic variables, such as program of study, precise age, or gender, which may influence usage patterns. Therefore, these findings are interpretative and should be explored further in future research, particularly by including demographic factors as additional variables in the analysis.

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