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# The impact of office administration performance on customer satisfaction at PT Media Mover

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### *Abstrak*

*Penelitian ini bertujuan untuk menginvestigasi pengaruh kinerja administrasi perkantoran terhadap kepuasan pelanggan di PT Media Mover. Dalam penelitian ini, digunakan pendekatan kuantitatif dengan metode survei, dan pengumpulan data dilakukan melalui kuesioner yang disebarkan kepada pelanggan perusahaan. Jumlah responden yang terlibat dalam penelitian ini adalah 50 orang pelanggan. Data yang diperoleh dianalisis menggunakan uji statistik deskriptif, serta uji validitas dan reliabilitas, diikuti dengan analisis regresi linier sederhana. Hasil penelitian menunjukkan adanya pengaruh positif dan signifikan antara kinerja administrasi perkantoran dan kepuasan pelanggan. Temuan ini mengindikasikan bahwa semakin baik kinerja administrasi, semakin tinggi tingkat kepuasan pelanggan yang dirasakan. Oleh karena itu, disarankan kepada perusahaan untuk terus meningkatkan kualitas pelayanan administrasi, khususnya dalam aspek ketepatan waktu, keakuratan informasi, dan sikap pelayanan yang ramah.*

*Kata kunci: kepuasan pelanggan; kinerja; manajemen perkantoran; pelayanan*

### Abstract

This study investigates the impact of office administration performance on customer satisfaction at PT Media Mover. A quantitative approach with a survey method was employed, utilizing questionnaires distributed to the company's customers. The study involved 50 customer respondents, with data analyzed through descriptive statistical tests, validity and reliability assessments, followed by simple linear regression analysis. Results demonstrate a significant positive relationship between office administration performance and customer satisfaction. These findings indicate that enhanced administrative performance correlates with higher levels of customer satisfaction. Therefore, companies should prioritize continuous improvement in administrative service quality, particularly focusing on timeliness, information accuracy, and courteous service delivery.

Keywords: customer satisfaction; office management; performance; service

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## Introduction

In today's rapidly evolving globalized and digitalized environment, the quality of office administration services has emerged as a critical determinant of customer satisfaction levels. Office administration functions extend beyond mere operational support; they play a pivotal role in shaping corporate image and customer perceptions. Effective administrative performance, encompassing timeliness, process efficiency, and responsiveness to customer requests, significantly influences customer experiences during company interactions (Ruru & Kolondam, 2022).

Contemporary technological advancements have heightened customer expectations for faster, more accurate, and professional administrative services. Research conducted by Yakub et al. (2022) demonstrates that effective administrative services contribute significantly to customer satisfaction across various sectors, both governmental and private. This development compels organizations to adapt to emerging technologies and enhance administrative staff competencies to meet evolving customer expectations.

PT Media Mover, a company operating in the media and technology services sector, faces challenges in improving administrative efficiency to maintain customer loyalty. While many organizations have transitioned to digital-based administrative systems, various issues persist, including insufficient employee skills in operating digital systems, delays in responding to customer requests, and inefficiencies in document and information management. These challenges can negatively impact customer satisfaction and risk customer attrition due to ineffective administration (Irawan & Laksono, 2020).

In Indonesia, the challenge of improving customer satisfaction with administrative services remains significant for many companies. Data presented by Apriani et al. (2023) indicates that 35% of customer complaints in the service sector stem from inadequate administrative service quality, including response delays, recording errors, and poor inter-departmental coordination. This reveals gaps in understanding and implementing effective office administration practices.

Although previous research has examined the relationship between service quality and customer satisfaction, there remains insufficient investigation into how office administration performance specifically influences customer satisfaction levels. Studies by Astawa and Manuaba (2023) focused on digitalization of administrative services, while research by Nugraha (2022) emphasized employee professionalism in administrative service delivery. Therefore, comprehensive examination of overall administrative performance contribution to customer experience is necessary.

This research aims to bridge this gap by analyzing the influence of various administrative performance aspects—including service speed, document accuracy, and communication quality—on customer satisfaction levels at PT Media Mover. Through a quantitative approach, this study will collect data from PT Media Mover customers to identify significant administrative factors affecting their satisfaction.

The research findings are expected to provide new insights for companies in improving office administration effectiveness. Additionally, this study may serve as a reference for other organizations seeking to optimize administrative services to enhance customer satisfaction and build long-term loyalty.

Practically, this research will assist PT Media Mover in developing more structured administrative improvement strategies through employee training, administrative technology enhancement, and work procedure adjustments to achieve better efficiency. Theoretically, this research will contribute to the office administration field by enriching studies on administration's role in improving customer satisfaction in the digital era.

Based on this background, this research aims to empirically analyze the relationship between office administration performance and customer satisfaction at PT Media Mover. Furthermore, this

study will provide strategic recommendations to the company for optimizing administrative performance to achieve higher customer satisfaction levels.

## Research Methods

In quantitative research, data validity is considered one of the most crucial elements for ensuring that analytical results truly reflect existing reality. To achieve higher validity levels, this research employs not only quantitative data obtained from questionnaires but also utilizes data triangulation methods. This triangulation is conducted through brief interviews with selected respondents to complement existing information (Azizah, 2015).

The primary purpose of this triangulation is to verify and provide deeper understanding of quantitative data. Interviews were conducted semi-structurally using open-ended question guides designed to explore customer perspectives regarding administrative services and their satisfaction levels. These qualitative interviews involved informants who had previously completed questionnaires, enabling researchers to confirm their responses in quantitative instruments (Sigit & Suharsono, 2014).

Interview questions included: (1) How do you assess PT Media Mover's overall office administration performance? (2) Have you experienced problems in administrative processes at this company? If yes, what problems did you encounter? (3) Which aspect of administrative services do you find most satisfying and why? (4) Do speed and accuracy in administrative processes influence your satisfaction as a customer? (5) What improvements do you think are needed in administrative services to enhance your satisfaction?

Through these questions, researchers can collect descriptive and in-depth supporting data. Qualitative data obtained from interviews are then analyzed alongside quantitative data to ensure consistency and meaning in findings. If inconsistencies exist between quantitative and qualitative results, researchers will investigate potential gaps in perception, questionnaire item comprehension, or personal customer experience contexts (Belang, 2019).

This triangulation plays an important role in enhancing construct validity and internal validity, particularly in studies emphasizing relationships between human behavioral variables such as service and satisfaction. Therefore, integrating qualitative data from brief interviews becomes an essential part of research design aimed at strengthening result validity and supporting collected data interpretation (Azizah, 2015).

Sample representativeness is a key factor in determining how far research results can be applied to broader populations. In this research, respondent inclusion criteria were adjusted from previously only including active customers in the last 3 months to customers who had used services within the last 12 months. This adjustment is designed to eliminate limitations in covered customer experience and expand analyzed perception variations (Sigit & Suharsono, 2014).

By extending the respondent inclusion timeframe, obtained data becomes more diverse and reflects customer satisfaction dynamics more comprehensively. Customers who have interacted with administrative services over longer periods provide insights regarding consistency and changes in service performance that may not be visible in short-term observations. This experience variation is crucial for recognizing administrative service patterns and their relationship with customer satisfaction across various temporal contexts and conditions (Belang, 2019).

Additionally, this method contributes to reducing selection bias possibilities that occur when selected respondents inadvertently represent only one specific group within the customer population. If focusing only on new customers, research results could be heavily influenced by temporary services such as special offers, specific programs, or staff changes. By involving customers from a 12-month period, experience variation can increase, making obtained results more objective (Azizah, 2015).

Adjustments to inclusion criteria also influence statistical quality by expanding data diversity that supports existing assumptions in regression analysis. This supports more normal data distribution, more diverse variables, and more consistent interpretation. Therefore, this methodological approach directly contributes to research external validity and strengthens the foundation for result generalization (Belang, 2019).

In linear regression analysis, there are various classical assumptions that must be met for estimation results to be BLUE (Best Linear Unbiased Estimator). One such assumption is homoscedasticity, referring to conditions where error (residual) variation must be consistent across all observations. If error variation is not uniform, this is called heteroscedasticity, which can potentially cause errors in standard error calculations, p-values, and conclusions regarding statistical significance (Statistikian, 2020).

To detect heteroscedasticity symptoms in this research, a scatterplot method was used, mapping Regression Standardized Predicted Value on the X-axis and Regression Studentized Residual on the Y-axis. Through this visual method, researchers can observe whether residual points are randomly scattered around the horizontal zero line or form specific patterns indicating non-constant variance (Statistikian, 2020).

Scatterplot analysis findings in this research show non-random residual distribution patterns, indicating heteroscedasticity presence in the regression model. This heteroscedasticity indicates certain elements from independent variables causing irregularities in residual variance, thus affecting the effectiveness of statistical models used (Statistikian, 2020).

Violations of homoscedasticity assumptions affect statistical inference reliability. Inaccurate standard errors can potentially cause errors in t-tests and F-tests, leading to Type I or Type II errors incorrectly accepting or rejecting hypotheses. Therefore, corrective measures such as variable transformation, robust regression models, or weighted least squares (WLS) techniques should be considered for more valid estimation (Statistikian, 2020).

In this research context, heteroscedasticity presence is noted and considered in regression result interpretation. Although variable relationships appear significant, this assumption violation indicates that results must be interpreted methodologically with caution. Researchers also provide opportunities for further analysis using more robust methods as follow-up to these findings (Statistikian, 2020). Figure 1 presents the heteroscedasticity test results, showing the distribution pattern of residuals that indicates the presence of heteroscedasticity in the regression model.

**Figure 1**
*Heteroscedasticity test scatterplot*
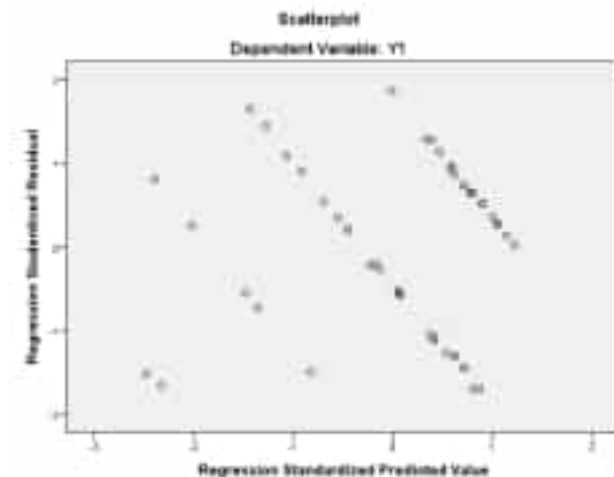


This research adopts a quantitative approach with an associative focus. This method was chosen because the primary research objective is to analyze the influence between two variables: office administration performance as the independent variable and customer satisfaction as the dependent variable. By using a quantitative approach, researchers can measure this influence objectively and statistically, while testing previously formulated hypotheses.

This study is explanatory in nature and aims to explain causal relationships between office administration work systems and customer satisfaction perceptions. This approach is considered relevant in contributing to office administration science development, particularly in public service contexts.

The quantitative method selection is also based on its ability to generate numerical data that can be analyzed using valid and accurate statistical tests. Research results are expected to provide systematic, empirical, and logical descriptions of the investigated influence (Creswell, 2013).

This research was conducted at PT Media Mover, a company specializing in moving services for apartments, homes, and offices. This location selection has strong foundations, as PT Media Mover maintains a well-structured office administration system with extensive customer interactions. Efficient administrative system presence is crucial for supporting company operational services. Additionally, this location facilitates researcher data collection.

The research was planned to span two months, from May to June 2025. Phases begin with research instrument preparation and permit arrangements in the first and second weeks of May, followed by instrument testing in the third week. Subsequently, in June, questionnaires will be distributed and data collected. Data processing and analysis are scheduled for the third and fourth weeks of June 2025. This scheduling ensures smooth research implementation and efficient time utilization (Mahi, 2011).

The research population includes all customers who utilized PT Media Mover services within the last six months. These customers have direct experience interacting with the company's administrative team, enabling them to provide valuable information about service quality and satisfaction levels. Population selection inclusion criteria include customers who have used PT Media Mover services at least once and are willing to complete questionnaires. Meanwhile, exclusion criteria include customers who utilized services more than six months ago and those unwilling to participate as respondents.

Sampling was conducted using purposive sampling, a sample selection technique based on specific considerations aligned with research objectives. The planned sample size is 50 respondents, determined using the Slovin formula with a 10% error rate. Through this purposive sampling technique, representative samples of the studied population are expected to be obtained (Sugiyono, 2018).

To ensure clarity and measurement accuracy, this research employs operational definitions for studied variables. The first variable is office administration performance, conceptually understood as effectiveness and efficiency in conducting various administrative tasks, including information services, data recording, and customer communication. Operationally, this variable is measured through several indicators, including service speed, customer data accuracy, and administrative staff ability to communicate clear information.

The second variable is customer satisfaction, conceptually referring to the extent customers' expectations are fulfilled through received services. In operational measurement, customer satisfaction is measured using indicators such as comfort in administrative processes, communication ease, and customer willingness to recommend services to others. Both variables are measured using five-point Likert scales for each statement item, with response ranges from "strongly disagree" to "strongly agree" (Kotler & Keller, 2016).

Data collection was conducted by distributing questionnaires to selected customer samples. These questionnaires were designed with closed statements using five-point Likert scales, aiming to measure customer perceptions of company administrative performance and their satisfaction levels. Questionnaire selection as the data collection method is considered efficient as it can reach many respondents within short timeframes while facilitating quantitative data analysis. Additionally, researchers collected secondary data through company administrative activity report documentation. To ensure instrument validity, questionnaires were piloted with ten respondents having similar characteristics, with pilot results serving as revision foundations. Questionnaire content validity was also strengthened with input from administration field experts and academics, ensuring proposed statements align with studied constructs (Soehartono, 2012).

Collected data will be analyzed using simple linear regression techniques to identify office administration performance variable influence on customer satisfaction. Before conducting primary analysis, data will undergo classical assumption tests, including normality and linearity tests, to ensure data meets regression analysis requirements. Data processing will be conducted using SPSS software, enabling fast and accurate statistical processing. In this regression analysis, regression coefficients and significance values will serve as foundations for drawing conclusions about inter-

variable relationships. Data analysis will be conducted systematically to answer problem formulations and test previously established hypotheses (Ghozali, 2018).

Data validity in this research is maintained by implementing series of validity and reliability tests on used instruments. Validity is tested empirically through correlation analysis between items and total scores, while reliability is measured using Cronbach's Alpha tests with established thresholds $\geq 0.70$. Additionally, data collection processes consider neutrality and confidentiality while avoiding bias by using objective statements that do not direct respondents. To ensure result accuracy, data triangulation is also conducted by comparing primary and secondary data and testing result consistency among respondents. Through these measures, comprehensive data validity and accuracy are expected to be ensured (Azwar, 2015).

Validity testing aims to ensure research instruments can measure targeted variables accurately. Content validity is evaluated through expert assessments, while construct validity is tested by analyzing consistency between indicators within one variable. Validity testing processes include correlation analysis between each item score and total scores, requiring obtained correlation coefficients to be significant. Meanwhile, reliability is measured using Cronbach's Alpha techniques, functioning to assess instrument internal consistency. If obtained alpha values reach or exceed 0.70, instruments are considered reliable. These steps are crucial for ensuring collected data is consistent and trustworthy, making research results scientifically accountable (Sugiyono, 2018).

In this research, instruments used are closed questionnaires designed based on operational definitions and indicators from respective variables. Questionnaires consist of two parts: respondent identity data and statement items related to administrative performance and customer satisfaction. Each item is constructed using Likert scales offering five response choices. Item construction is based on indicators determined in operational definitions.

Instrument development processes are conducted gradually, starting from initial draft creation, content validity testing by experts, pilot testing on small respondent groups, to final revisions before broader instrument distribution. These instruments are designed to collect relevant data that can be analyzed quantitatively to answer research problem formulations (Arikunto, 2014).

## Results and Discussion

Research data were collected by directly distributing questionnaires to encountered respondents. Questionnaires were obtained through direct researcher-respondent meetings, providing questionnaires for respondent completion. The sampling technique used was Quota Sampling, where sample selection is based on predetermined quantities. This sampling is based on easily encountered subjects, facilitating easy data collection and fulfilling established quotas. The obtained sample size was 50 respondents, thus fulfilling SPSS analytical tool data processing requirements.

Descriptive data presentation aims to reveal research data profiles and existing relationships between variables used in research. Descriptive data describing respondent conditions constitute additional information for understanding research results. Research respondents possess specific characteristics including: Gender data for PT Media Mover customer respondents are presented in Figure 2, which shows the distribution of male and female participants in the study.

**Figure 2**
*Gender distribution of respondents*

**Table 1**
*Gender distribution of respondents*

| Gender | Frequency | Percentage |
|--------|-----------|------------|
| Male   | 18        | 36%        |
| Female | 32        | 64%        |
| Total  | 50        | 100%       |

Based on the information in the table 1 above, as shown in Figure 2, PT Media Mover customer respondents taken as participants were predominantly female at 64% and male at 36%. This indicates that most respondents in this research were female.

Age data for respondents were grouped into 4 categories: under 20 years, 21-30 years, 31-40 years, and over 40 years. Customer age data taken as respondents are presented in Figure 3.

**Figure 3**
*Age*
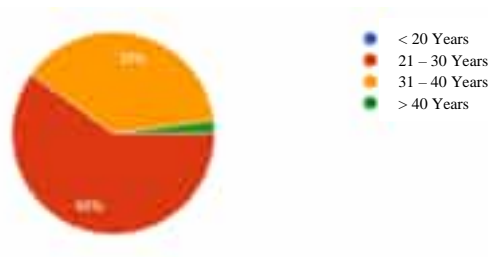


**Table 2**
*Age*

| Age | Frequency | Percentage |
|-----|-----------|------------|
| < 20 years | - | - |
| 21–30 years | 27 | 60 % |
| 31–40 years | 14 | 38 % |
| > 40 years | 9 | 18% |
| Total | 50 | 100% |

Based on Table 2 above and as illustrated in Figure 3, respondent ages range from 20 to over 40 years, with dominance in the 21-30 years group at 54%, indicating that the majority of respondents are in productive and economically active age ranges.

Service usage data for respondents were divided into three groups based on service usage frequency. Respondent service usage data are presented in Figure 4.

**Figure 4**
*Number of service uses by respondents*

**Table 3**
*Number of service uses by respondents*

| Usage Frequency | Number of Respondents | Percentage |
|---|---|---|
| 1 time | 10 | 20% |
| 2- 3 times | 28 | 56% |
| > more than 3 times | 12 | 24% |
| Total | 50 | 100% |

Based on the table 3 above and as shown in Figure 4, most respondents used PT Media Mover services 2-3 times, totaling 28 people or 56%, followed by usage more than 3 times with 12 people or 24%, and one-time usage with 10 people or 20%. This indicates that most customers are repeat users quite familiar with services.

Service types used by research respondents were grouped into 3 categories: House Moving, Apartment Moving, and Office Moving. The distribution is presented in Figure 5.

**Figure 5**
*Types of services used by respondents*



**Table 4**
*Types of services used by respondents*

| Service Type | Frequency | Percentage |
|---|---|---|
| House Moving | 26 | 52% |
| Apartment Moving | 14 | 28% |
| Office Moving | 10 | 20% |
| Total | 50 | 100% |

Based on the table 4 above and as illustrated in Figure 5, the most frequently used service type by respondents was house moving at 52%, followed by apartment moving at 28%, and office moving at 20%. This indicates that house moving services constitute the most dominant service used by PT Media Mover customers.

**Research Results**

Validity testing was conducted by calculating correlations between question item scores and construct or variable scores. This can be accomplished through significance testing indicating that items or questions can be considered valid. From validity test tables, all calculated r values are greater than table r values (calculated $r > 0.284$) with positive correlation directions. Therefore, it can be concluded that all question items in this research questionnaire are valid.

Reliability testing is used to measure questionnaires that constitute variable indicators. Statistical reliability measurement uses Cronbach's Alpha. Variables are considered reliable if Cronbach's Alpha values exceed 0.70 ($> 0.70$). For instrument reliability testing, SPSS analysis was

employed. Table 1 presents the reliability statistics for the research instrument, demonstrating the internal consistency of the measurement scales used in this study.

**Table 5**
*Reliability Statistics*

| Cronbach's Alpha | N of Items |
|---|---|
| .964 | 16 |

From Table 5 above, it can be determined that each variable has Cronbach's Alpha values exceeding 0.70, concluding that all X and Y variables are reliable and questionnaires can be used as data collection tools.

Data analysis in this research was conducted using regression analysis models, processed using SPSS version 25 based on data obtained from 50 respondents. Office administration performance variable questionnaires consisted of 8 statement items, and customer satisfaction variable questionnaires consisted of 8 question items. Each question item included alternative answers: "strongly agree" (SS), "agree" (S), "neutral" (NT), "disagree" (TS), and "strongly disagree" (STS), with scoring 5, 4, 3, 2, and 1 respectively. Based on these provisions, questionnaire results from 50 respondents are presented in Table 6.

Table 6 shows the ANOVA results from the regression analysis, which tests the overall significance of the model predicting customer satisfaction from office administration performance.

**Tabel 6**
*Anova*

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 12.749 | 1 | 12.749 | 35.476 | .000[b] |
| Residual | 17.251 | 48 | .359 | | |
| Total | 30.000 | 49 | | | |

## Discussion

In this research, the author used a sample consisting of 50 respondents taken from the same total population of 50 people. The majority of respondents were PT Media Mover customers using moving services for apartments, houses, and offices in the Greater Jakarta area. After conducting research, the author continued with analysis constituting processing from hypothesis testing results. This analysis aims to produce interpretations from conducted calculations using regression formulas between X and Y variables.

The analysis process began by conducting t-tests and determining calculated F values to determine whether these values lie in $H_0$ acceptance or rejection regions. T-test results on office administration performance variables showed t values of 5.955 with degrees of freedom dk = n - 2 = 50 - 2 = 48, and obtained P Values of 0.000, smaller than $\alpha = 0.05$. This constitutes strong evidence for rejecting $H_0$, concluding that office administration performance significantly influences customer satisfaction at PT Media Mover. Subsequently, F-test results show calculated F values greater than table F values (35.476 > 4.04), indicating calculated F values lie in $H_0$ rejection and Ha acceptance regions.

Office administration performance influence on customer satisfaction is measured by determination coefficients ($R^2$) of 0.425 or 42.5%. This indicates office administration performance has 42.5% influence on PT Media Mover customer satisfaction, while the remaining 57.5% is influenced by other factors such as service speed, service costs, moving goods security, and other additional service factors. Although not all factors contribute to customer satisfaction, office administration performance still plays important roles by helping customers experience ease and speed in service delivery. Additionally, organized administration functions to enhance company credibility in customer eyes, potentially increasing customer loyalty toward PT Media Mover services.

The findings from this research, as demonstrated in Tables 1 and 2, along with the demographic analysis shown in Figures 2 through 5, provide strong empirical evidence for the significant positive relationship between office administration performance and customer satisfaction. The heteroscedasticity test results presented in Figure 1, while indicating some model limitations, do not diminish the overall significance of the relationship discovered.

## Conclusion

Based on quantitative data analysis collected from 50 respondents, this study demonstrates a significant positive influence between office administration performance and customer satisfaction at PT Media Mover. Administrative performance encompassing service timeliness, data accuracy, and positive administrative staff attitudes proves capable of enhancing customer positive perceptions of received services. This is demonstrated through determination coefficient ($R^2$) values of 42.5%, meaning nearly half of customer satisfaction variation can be explained by office administration performance quality. These findings imply that companies need to focus more attention on administrative system improvements, including human resource capability development, administrative process digitalization, and consistent service standard implementation to maintain and enhance customer loyalty. Furthermore, this study's results support office administration theory development in service contexts, particularly for private companies operating in moving service sectors. However, this study has several limitations, including research focus on only one company, relatively small sample size, and heteroscedasticity presence in regression models that may affect estimation accuracy. Therefore, it is recommended that future researchers conduct follow-up studies with larger samples, multi-company approaches, and more robust statistical analysis techniques so research results can be more generalizable and provide more significant empirical contributions to office administration fields.

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# The influence of parental background and "Viska Mart" business center on students' entrepreneurial interest

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***Abstrak***

*Penelitian ini bertujuan untuk mengetahui pengaruh latar belakang orang tua dan business center "Viska Mart" terhadap minat berwirausaha siswa kelas XI Pemasaran di SMK Negeri 6 Surakarta, secara parsial maupun simultan. Penelitian ini menggunakan pendekatan kuantitatif korelasional. Jumlah populasi 72 siswa. Penentuan sampel menggunakan sampling jenuh. Pengumpulan data menggunakan kuesioner. Analisis data menggunakan analisis regresi linear berganda melalui aplikasi IBM SPSS Statistics 27. Hasil penelitian menunjukkan: (1) terdapat pengaruh positif dan signifikan latar belakang orang tua terhadap minat berwirausaha dengan nilai signifikansi sebesar 0,036 < 0,05 dan nilai $t_{hitung} > t_{tabel}$ (2,144 > 1,997); (2) terdapat pengaruh positif dan signifikan business center "Viska Mart" terhadap minat berwirausaha dengan nilai signifikansi sebesar 0,000 < 0,05 dan nilai $t_{hitung} > t_{tabel}$ (4,936 > 1,997); (3) terdapat pengaruh positif dan signifikan latar belakang orang tua dan business center "Viska Mart" secara simultan terhadap minat berwirausaha dengan nilai signifikansi sebesar 0,000 < 0,05 dan nilai $F_{hitung} > F_{tabel}$ (22,736 > 3,13). Persamaan regresi penelitian yaitu $\hat{Y} = 19,911 + 0.563X_1 + 0.814X_2$ dengan $R^2$ sebesar 0,397. Sumbangan efektif $X_1$ terhadap Y sebesar 9,4%. Sumbangan efektif $X_2$ terhadap Y sebesar 30,3%. Sumbangan relatif $X_1$ terhadap Y sebesar 23,7%. Sumbangan relatif $X_2$ terhadap Y sebesar 76,3%.*

*Kata kunci: kuantitatif; minat berwirausaha; orang tua; praktik kewirausahaan*

**Abstract**

This research aims to determine the influence of parental background and the "Viska Mart" business center on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta, both partially and simultaneously. This study employs a quantitative correlational approach with a population of 72 students. Sample determination utilized saturated sampling methods, and data collection was conducted through questionnaires. Data analysis employed multiple linear regression analysis using IBM SPSS Statistics 27. Results demonstrate: (1) a significant positive influence of parental background on entrepreneurial interest

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with a significance value of 0.036 < 0.05 and t-calculated > t-table (2.144 > 1.997); (2) a significant positive influence of the "Viska Mart" business center on entrepreneurial interest with a significance value of 0.000 < 0.05 and t-calculated > t-table (4.936 > 1.997); (3) a significant positive simultaneous influence of parental background and "Viska Mart" business center on entrepreneurial interest with a significance value of 0.000 < 0.05 and F-calculated > F-table (22.736 > 3.13). The research regression equation is $\hat{Y} = 19.911 + 0.563X_1 + 0.814X_2$ with $R^2$ of 0.397. The effective contribution of $X_1$ to Y is 9.4%, while $X_2$ contributes 30.3%. The relative contribution of $X_1$ to Y is 23.7%, and $X_2$ contributes 76.3%.

## Introduction

In the increasingly advanced era of globalization, workforce competition has intensified, leading to rising unemployment rates. According to Statistics Indonesia (BPS) as of February 2024, unemployment in Indonesia reached 4.82% or 7.86 million people. The open unemployment rate (TPT) for vocational high school (SMK) graduates was 8.62%. The open unemployment rate in Surakarta City is considerably high, reaching 16,849 people or 5.83% of the workforce (Statistics Indonesia, 2024). Most vocational high school graduates fail to secure employment after graduation, with unemployment figures reaching 1,580 people. Based on these unemployment data, the highest number of unemployed individuals comes from educated groups, particularly SMK graduates.

High unemployment rates can adversely impact economic growth. This aligns with research findings by Irawan et al. (2024), which state that labor shortages negatively affect economic growth because high unemployment rates indicate increasing numbers of people struggling to meet their basic needs. Therefore, unemployment issues must be addressed promptly to prevent adverse impacts on Indonesia's economy.

Sunarni et al. (as cited in Savitri et al., 2024) argue that entrepreneurship represents one solution to unemployment problems. This perspective aligns with Joseph Schumpeter's assertion (as cited in Suwandi et al., 2024) that entrepreneurs contribute significantly to economic development through innovation creation, job creation, and welfare enhancement. However, entrepreneurial spirit in Indonesia remains relatively low. According to the Global Entrepreneurship Index (GEI) in 2022, Indonesia ranked 75th out of 137 countries (based on Global Entrepreneurship Monitor data). This ranking indicates relatively low entrepreneurial activity compared to other nations.

Furthermore, the problem of low entrepreneurial interest among SMK students also occurs at SMK Negeri 6 Surakarta, particularly among Marketing Department students. Based on observations conducted by researchers during entrepreneurial practice activities performed by Grade XI Marketing students, most students appeared unenthusiastic in conducting entrepreneurial activities. This was evident as most students did not optimally promote their products, with many promoting only through WhatsApp and few promoting directly to potential buyers. Additionally, students appeared to lack confidence in offering products to potential buyers, showing hesitation when speaking during product promotion.

Moreover, based on preliminary studies conducted with Grade XI Marketing students at SMK Negeri 6 Surakarta involving 30 respondents, 66.7% of students were interested in continuing to higher education, 20% were interested in entrepreneurship, 6.7% were interested in working, 3.3% were interested in entrepreneurship while studying, and 3.3% were interested in working while studying. These data show that entrepreneurial interest after graduation among Grade XI Marketing students at SMK Negeri 6 Surakarta was only 7 people, indicating that students' desire to become

entrepreneurs after school graduation remains low. The low entrepreneurial interest among students after SMK graduation, particularly in the marketing department, is further reinforced by 2023 graduate absorption data released by the Special Job Exchange (BKK) of SMK Negeri 6 Surakarta. These data reveal that marketing department graduates who became entrepreneurs numbered fewer than 10 people, representing the smallest number compared to Marketing Department graduates who found employment (more than 30 people), pursued higher education (more than 10 people), and other categories (20 people). Based on these data, few Marketing Department graduates from SMK Negeri 6 Surakarta are interested in becoming entrepreneurs.

Students' entrepreneurial interest can be influenced by several factors, including parental background. Family environment, specifically parental background, can influence students' entrepreneurial interest. Parental background can serve as motivation to influence individuals to engage in entrepreneurial behavior. This aligns with Sukron Djazilan and Darmawan (2022), who explain that family environment, particularly parents, plays important roles in motivating children to pursue entrepreneurship. Conversely, when families, especially parents, do not support individuals in entrepreneurship, entrepreneurial interest will decrease or individuals will not be interested in entrepreneurship (Setiawan & Sukanti, 2016).

Research conducted by Nasrullah (2016) indicates that parental background significantly influences entrepreneurial interest. However, research by Savitri et al. (2024) found no significant influence of parental background variables on students' entrepreneurial motivation. These two studies show different results, necessitating further research on parental background influence on entrepreneurial interest.

Additionally, another factor considered influential on students' entrepreneurial interest is entrepreneurship education through business centers in schools. According to Vera Olivia (as cited in Indra & D.W.P, 2016), implementing business center activities in SMK aims to optimize students in entrepreneurship both while still in school and after graduation, so business center practice can increase entrepreneurial interest. This is also supported by Khoirina and Martha (2023), who explain that school business center programs can enhance students' entrepreneurial interest and skills. Students can practice entrepreneurship theories learned in class through business center programs. Therefore, student involvement in business centers can increase students' entrepreneurial interest.

The business center at SMK Negeri 6 Surakarta is named Viska Mart. Every Marketing Department student performs practice at Viska Mart in rotation according to attendance numbers, starting from the earliest numbers. Practice duration for each student is 3 days. At any given time, only one student from each class performs practice at Viska Mart. Practice activities include cashier duties and product display. The objectives of implementing these activities include: (a) production-based training facilities for students; (b) fostering and developing entrepreneurial spirit among teachers and students; (c) supporting funding for maintenance, facility additions, and other operational costs; (d) developing independence and self-confidence in student practice implementation; and (e) enhancing creativity and innovation in practical learning. Therefore, based on the objectives of practice implementation at Viska Mart, it can be determined that practice at the "Viska Mart" business center can influence students' entrepreneurial interest.

Based on previous research conducted by Daramitha Utami and Denmar (2020) and Indra and D.W.P (2016), business centers influence students' entrepreneurial motivation or interest. This means that when business centers improve, entrepreneurial motivation or interest also improves. Results from these studies align with research by Kurnia Fatmawati et al. (2023), which states that "Empowerment of the Business Center as a means of cultivating entrepreneurial characteristics for students has gone well, it can be seen from several students, most of the students have been able to read business opportunities, and can manage sales finances." This aligns with research by Ahmed et al. (2020), which states that "Positive student experience across different components of entrepreneurship programme have a positive impact on students' intentions to start their own business." Based on these studies, researchers are interested in examining this topic more deeply with different subjects and problems to determine business center influence on students' entrepreneurial interest.

Based on this description, researchers are interested in conducting research on the influence of parental background and "Viska Mart" business center on students' entrepreneurial interest. This research presents novelty in several aspects. First, one independent variable in this research, the

"Viska Mart" business center, has not been used as an independent variable in research related to entrepreneurial interest. Second, no research has examined the influence of parental background and "Viska Mart" business center together on students' entrepreneurial interest. Therefore, this research aims to provide theoretical contributions regarding factors influencing students' entrepreneurial interest.

The research problems include: (1) Is there an influence of parental background on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta?; (2) Is there an influence of the "Viska Mart" business center on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta?; and (3) Is there a simultaneous influence of parental background and "Viska Mart" business center on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta?

## Research Methods

This research was conducted at SMK Negeri 6 Surakarta, located at Jalan Adi Sucipto No. 38, Kerten, Laweyan District, Surakarta City, Central Java 57143. SMK Negeri 6 Surakarta was selected as the research location due to problems with low entrepreneurial interest, supported by 2023 graduate absorption data released by the Special Job Exchange (BKK) of SMK Negeri 6 Surakarta.

This research employs a quantitative approach with correlational methods. This study contains plans and procedures consisting of steps to determine the influence of parental background and "Viska Mart" business center on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta.

Independent variables in this research are parental background $(X_1)$ and "Viska Mart" business center $(X_2)$, while the dependent variable is students' entrepreneurial interest $(Y)$. Parental background is reflected through parental educational background and occupational background. The "Viska Mart" business center is assessed based on educational, economic, and social aspects of entrepreneurial practice activities at SMK Negeri 6 Surakarta. Entrepreneurial interest is reflected through assessments based on feelings of enjoyment, attraction, attention, and individual involvement in entrepreneurial activities.

Research data collection utilized questionnaires with closed questions distributed through Google Forms. These questionnaires employed modified Likert scale models with four alternative answers: strongly agree (SS), agree (S), disagree (TS), and strongly disagree (STS).

Questionnaires were piloted with 32 respondents who were not research samples. Requirements for stating valid items in this research involved comparing rxy results with product moment tables; if rcalculated > rtable (0.349) with 5% significance level, questionnaires were valid and could be used as measurement tools. Items were considered reliable if Cronbach's Alpha values > 0.60. Validity and reliability test results through IBM SPSS 27 are presented in Table 1.

**Table 1**
*Validity and Reliability Test Results*

| Variable | Validity Test | Reliability Test |
|---|---|---|
| Parental background | 8 statement items all valid | Reliable (0.623 > 0.6) |
| "Viska Mart" business center | 11 of 12 statements valid | Reliable (0,799 > 0,6) |
| Entrepreneurial interest | 19 of 21 statements valid | Reliable (0,860 > 0,6) |

The research population consists of Grade XI Marketing students at SMK Negeri 6 Surakarta, totaling 72 students. The sampling technique employed non-probability sampling with saturated sampling, making the research sample all Grade XI Marketing students at SMK Negeri 6 Surakarta, totaling 72 students.

Data analysis techniques employed multiple linear regression using IBM SPSS Statistics 27 for data processing. Before data analysis, researchers conducted prerequisite tests consisting of normality tests, linearity tests, heteroscedasticity tests, and multicollinearity tests. After passing prerequisite tests, researchers conducted hypothesis testing to determine whether proposed hypotheses were accepted or rejected. Hypothesis testing included t-tests (partial t), F-tests, multiple

linear regression analysis, determination coefficients, and effective and relative contribution calculations.

## Results and Discussion

### Research Results

Based on descriptive data analysis, the entrepreneurial interest variable showed minimum value 47, maximum value 76, mean 63.21, median 62.50, and mode 60. This variable consists of 19 statement items with total scores based on obtained data of 4,551. Additionally, the parental background variable consists of 8 statement items. This variable showed minimum value 17, maximum value 32, mean 23.51, median 24.00, and mode 24. Total scores obtained for this variable were 2,658. Furthermore, the "Viska Mart" business center variable showed minimum value 28, maximum value 44, mean 36.92, median 36.00, and mode 33. Total scores based on obtained data were 1,693, consisting of 11 statement items.

Researchers conducted prerequisite tests before hypothesis testing. These prerequisite tests included normality tests, linearity tests, heteroscedasticity tests, and multicollinearity tests. Normality tests revealed significance values of $0.200 > 0.05$, indicating that all data had normal distribution. Subsequently, linearity tests showed that parental background and entrepreneurial interest had deviation from linearity values of $0.494 > 0.05$, indicating linear relationships between parental background and entrepreneurial interest. Linearity test results for "Viska Mart" business center toward entrepreneurial interest showed deviation from linearity values of $0.886 > 0.05$, indicating linear relationships between "Viska Mart" business center and entrepreneurial interest. Heteroscedasticity test results showed parental background significance values of 0.941 and "Viska Mart" business center significance values of 0.254, both greater than 0.05, indicating no heteroscedasticity symptoms in either variable. Additionally, multicollinearity test results revealed that parental background and "Viska Mart" business center had tolerance values of 0.829 where $0.829 > 0.10$ and VIF values of 1.206 where $1.206 < 10$, indicating no multicollinearity symptoms in either variable. Table 2 presents the t-test results, which examine the partial influence of each independent variable on the dependent variable.

**Table 2**

*T-Test Results*

| Variable | t | Sig. |
|---|---|---|
| (Constant) | 2.980 | .004 |
| Parental background | 2.144 | .036 |
| "Viska Mart" business center | 4.936 | .000 |

Based on Table 2, t-tests determine the extent of independent variable influence on dependent variables partially. T-test results show parental background ($X_1$) significance values of 0.036 where $0.036 < 0.05$ and tcalculated values of 2.144 where $2.144 > 1.997$. Based on significance values smaller than 0.05 and tcalculated values greater than ttable, $H_0$ is not accepted, meaning there is significant partial influence of parental background variables ($X_1$) on entrepreneurial interest (Y). T-test results also show "Viska Mart" business center ($X_2$) significance values of 0.000 where $0.000 < 0.05$ and tcalculated values of 4.936 where $4.936 > 1.997$. Based on significance values smaller than 0.05 and tcalculated values greater than ttable, $H_0$ is not accepted, meaning there is significant partial influence of "Viska Mart" business center variables ($X_2$) on entrepreneurial interest (Y). Table 3 presents the F-test results, which examine the simultaneous influence of independent variables on the dependent variable.

**Tabel 3**
*F-Test Results*

|  | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 1699.304 | 2 | 849.652 | 22.736 | .000 |
| Residual | 2578.571 | 69 | 37.371 |  |  |
| Total | 4277.875 | 71 |  |  |  |

Based on Table 3, F-tests examine simultaneous significant influence of independent variables on dependent variables. F-test results show probability values in the Sig. column of 0.000 where $0.000 < 0.05$. Additionally, Fcalculated values of 22.736 where $22.736 > 3.13$. Based on significance values smaller than 0.05 and Fcalculated values greater than Ftable, $H_0$ is not accepted, meaning there is significant simultaneous influence of parental background variables ($X_1$) and "Viska Mart" business center variables ($X_2$) on entrepreneurial interest (Y). Table 4 presents the multiple linear regression analysis results, providing the regression equation for this study.

**Tabel 4**
*Multiple Linear Regression Results*

|  | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|
|  | B | Std. Error | Beta | t | Sig. |
| *(Constant)* | 19.911 | 6.682 |  | 2.980 | .004 |
| Parental background | .563 | .263 | .2220 | 2.144 | .036 |
| "Viska Mart" business center | .814 | .165 | .507 | 4.936 | .000 |

Based on Table 4, the multiple linear regression equation can be formulated as follows:
$$\hat{Y} = 19.911 + 0.563X_1 + 0.814X_2$$
This multiple linear regression equation can be interpreted as: (1) The constant value of 19.911 represents the state when entrepreneurial interest variable (Y) is not yet influenced by other variables, namely parental background variable ($X_1$) and "Viska Mart" business center variable ($X_2$). If independent variables are absent, entrepreneurial interest variable (Y) experiences no change; (2) The regression coefficient value for parental background variable ($X_1$) of 0.563 indicates positive influence on entrepreneurial interest (Y), meaning that every 1-unit increase in parental background variable ($X_1$) will influence entrepreneurial interest (Y) by 0.563, assuming other variables are not examined in this research; (3) The regression coefficient value for "Viska Mart" business center variable ($X_2$) of 0.814 indicates positive influence on entrepreneurial interest (Y), meaning that every 1-unit increase in "Viska Mart" business center variable ($X_2$) will influence entrepreneurial interest (Y) by 0.814, assuming other variables are not examined in this research. Table 5 presents the coefficient of determination results, showing the proportion of variance explained by the independent variables.

**Tabel 5**
*Coefficient of Determination Results*

| R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|
| .630[a] | .397 | .380 | 6.11315 |

Based on Table 5, the coefficient of determination ($R^2$) value is 0.397 or 39.7%. This indicates that entrepreneurial interest is influenced by parental background and "Viska Mart"

business center. The remaining 60.3% is influenced by other factors or variables not examined in this research. Table 6 presents the effective contribution calculations for each independent variable.

**Tabel 6**
*Effective Contribution*

| Variable | Regression Coefficient (Beta) | Correlation Coefficient | $R^2$ |
|---|---|---|---|
| Parental background | 0,220 | 0,429 | 0,397 |
| "Viska Mart" business center | 0,507 | 0,598 | 0,397 |

Based on Table 6, effective contributions of parental background and "Viska Mart" business center variables can be calculated using the following formula:

$$SE(X)\% = \beta X \times rxy \times 100\%$$

From this formula, the effective contribution of parental background to entrepreneurial interest is 9.4% (calculated from 0.220 x 0.429 x 100%) and the effective contribution of "Viska Mart" business center to entrepreneurial interest is 30.3%. Total effective contributions from both independent variables equal 39.7%, matching previously calculated R² values.

After determining R² values and effective contributions, relative contributions from both independent variables in this research can be calculated using the following formula:

$$SR(X)\% = SE(X)\% / R^2$$

Based on this formula, the relative contribution of parental background to entrepreneurial interest is 23.7% (calculated from 9.4% / 39.7%) and the relative contribution of "Viska Mart" business center to entrepreneurial interest is 76.3% (calculated from 30.3% / 39.7%). Total effective contributions from both independent variables equal 100% or 1.

## Discussion

Based on research results analyzed by researchers, there is significant influence of parental background variable ($X_1$) partially on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta (Y). This is evidenced by t-test results showing parental background ($X_1$) significance values of 0.036 where 0.036 < 0.05 and tcalculated > ttable values of 2.144 > 1.997. These results prove the first hypothesis: "there is parental background influence on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta." Research results demonstrate that parental background plays roles in determining students' interest in entrepreneurship after graduation. Parents with knowledge (observable through parental educational background) and experience (observable through parental occupational background) in entrepreneurship will encourage and facilitate children's entrepreneurial interest. This aligns with Novitasari (2019), who states that children's entrepreneurial character emerges through motivation, support, and knowledge and experience contributions from parents regarding characteristics needed to become entrepreneurs. Additionally, these findings align with research by Nasrullah (2016) and Wicaksono and Subiyono (2017), which state that parental background influences students' entrepreneurial interest.

Based on research results analyzed through t-test analysis, there is significant influence of "Viska Mart" business center variable ($X_2$) partially on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta (Y). This is evidenced by t-test results showing "Viska Mart" business center ($X_2$) significance values of 0.000 where 0.000 < 0.05 and tcalculated > ttable values of 4.936 > 1.997. Based on these results, the second hypothesis is proven: "there is 'Viska Mart' business center influence on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta." These findings prove that the existence of "Viska Mart" business center as entrepreneurial practice activities at SMK Negeri 6 Surakarta can increase students' entrepreneurial interest. This aligns with Vera Olivia's opinion (as cited in Indra & D.W.P, 2016), which states that implementing business center activities in SMK aims to optimize students in entrepreneurship both while still in school and after graduation, so business center practice can increase entrepreneurial interest. Additionally, these findings align with previous research by

Kurniawati and Kusmuriyanto (2019), Daramitha Utami and Denmar (2020), and Kurnia Fatmawati et al. (2023), which explain that business centers influence students' entrepreneurial interest or motivation, so when business center activities run well, entrepreneurial interest also improves.

Based on F-test results, significance values of 0.000 where 0.000 < 0.05 and Fcalculated > Ftable (22.736 > 3.13) indicate that parental background $(X_1)$ and "Viska Mart" business center $(X_2)$ simultaneously influence entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta (Y). Therefore, these results prove the third hypothesis: "there is simultaneous influence of parental background and 'Viska Mart' business center on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta." These findings prove that parental background and "Viska Mart" business center simultaneously influence entrepreneurial interest. This aligns with previous research by Lestari and Wijaya; Nastiti et al.; Suharti and Sirine; Suhartini (as cited in Zunaedy et al., 2021), which state that several factors influence entrepreneurial interest, including: (1) income expectations; (2) family and community environment; and (3) education. When related to factors influencing entrepreneurial interest, parental background represents family environment factors, while "Viska Mart" business center represents education factors in this research. Both variables simultaneously influence entrepreneurial interest.

## Conclusion

Based on conducted data analysis, the following conclusions can be drawn: (1) There is significant positive influence of parental background variable on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta. This is evidenced by t-test results showing parental background significance values of 0.036 where 0.036 < 0.05 and tcalculated > ttable values of 2.144 > 1.997, resulting in $H_0$ rejection and $H_1$ acceptance; (2) There is significant positive partial influence of "Viska Mart" business center variable on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta (Y). This is evidenced by t-test results showing "Viska Mart" business center significance values of 0.000 where 0.000 < 0.05 and tcalculated > ttable values of 4.936 > 1.997, resulting in $H_0$ rejection and $H_2$ acceptance; (3) There is significant positive simultaneous influence of parental background and "Viska Mart" business center on entrepreneurial interest among Grade XI Marketing students at SMK Negeri 6 Surakarta. This is shown by F-test results with significance values of 0.000 < 0.05 and Fcalculated > Ftable (22.736 > 3.13), resulting in $H_0$ rejection and $H_3$ acceptance. These findings prove that parental background and "Viska Mart" business center simultaneously influence entrepreneurial interest. The research regression equation is $\hat{Y} = 19.911 + 0.563X_1 + 0.814X_2$ with R² values of 0.397. Combined contributions of parental background and "Viska Mart" business center total 39.7%, with remaining 60.3% influenced by other variables not included in this research. Effective contributions of parental background to entrepreneurial interest total 9.4%, while "Viska Mart" business center effective contributions total 30.3%. Relative contributions of parental background to entrepreneurial interest total 23.7%, while "Viska Mart" business center relative contributions total 76.3%. Total relative contributions from both independent variables equal 100% or 1. This research has limitations requiring attention for future research improvement. This research has not examined other factors beyond parental background and "Viska Mart" business center. Additionally, this research scope remains limited, with populations only including Grade XI Marketing students at SMK Negeri 6 Surakarta, preventing result generalization to broader student populations. Therefore, future research can be conducted with broader coverage and more diverse methods to obtain more comprehensive understanding.

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# Impact of AI-based learning technology and teacher communication on student learning outcomes

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***Abstrak***

*Penelitian ini bertujuan untuk mengetahui pengaruh teknologi pembelajaran berbasis AI dan komunikasi interpersonal guru terhadap hasil belajar siswa paa mata pelajaran dasar – dasar kejuruan kelas X MPLB di SMK Negeri 1 Surakarta baik secara parsial maupun simultan. Populasi penelitian adalah siswa kelas X MPLB dengan sampel sebanyak 82 siswa yang dipilih melalui teknik proporsional random sampling. Data dikumpulkan melalui kuesioner dan dokumentasi, lalu dianalisis menggunakan regresi linear berganda dengan bantuan SPSS versi 26. Hasil analisis menunjukkan: (1) terdapat pengaruh positif dan signifikan teknologi pembelajaran berbasis AI terhadap hasil belajar siswa ($t_{hitung}$ 2,262 > $t_{tabel}$ 1,990; signifikansi 0,026 < 0,05), (2) tidak terdapat pengaruh signifikan komunikasi interpernonal guru terhadap hasil belajar siswa ($t_{hitung}$ -1,291 < $t_{ttabel}$ 1,990; signifikansi 0,201 > 0,05), dan (3) secara simultan, kedua variabel berpengaruh positif dan signifikan terhadap hasil belajar ($F_{hitung}$ 2,589 > $F_{tabel}$ 2,370; signifikansi 0,081 < 0,10). Kontribusi efektif kedua variabel sebesar 6,2% sedangkan 93,8% dipengaruhi fackor lain di luar penelitian ini.*

*Keywords: inovasi pembelajaran digital; interaksi guru – siswa; pencapaian akademik*

**Abstract**

This study aims to determine the impact of AI-based learning technology and teacher interpersonal communication on student learning outcomes in basic vocational subjects among Grade X Office Management and Business Services (MPLB) students at SMK Negeri 1 Surakarta, both partially and simultaneously. The research population consisted of Grade X MPLB students, with a sample of 82 students selected through proportional random sampling technique. Data were collected through questionnaires and documentation, then analyzed using multiple linear regression with SPSS version 26. Results demonstrate: (1) a significant positive impact of AI-based learning technology on student learning outcomes (t-calculated 2.262 > t-table 1.990; significance 0.026 < 0.05); (2) no significant impact of teacher interpersonal communication on student learning outcomes (t-calculated -1.291 < t-

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table 1.990; significance 0.201 > 0.05); and (3) simultaneously, both variables have a significant positive impact on learning outcomes (F-calculated 2.589 > F-table 2.370; significance 0.081 < 0.10). The effective contribution of both variables is 6.2%, while 93.8% is influenced by other factors outside this study.

## Introduction

The fourth industrial revolution has brought significant changes to the working world and influenced various aspects of life, including education. Education plays a crucial role in human development. Through education, individuals can understand their environment, recognize their roles in society, and prepare themselves to face future challenges (Dermawan et al., 2023). Education can occur in three forms: formal, non-formal, and informal. Formal education includes schools, colleges, or universities. Non-formal education encompasses courses or training programs. Meanwhile, informal education is acquired through daily experiences or activities. All forms of education must include cognitive, affective, and psychomotor aspects to provide comprehensive and profound learning experiences.

Education and learning outcomes have a very close relationship. Education aims to improve student learning outcomes in terms of knowledge, skills, and attitudes. Learning outcomes represent the achievement manifestation from processes undergone during learning. According to Prastiyo (as cited in Damayanti, 2022), learning outcomes constitute an accumulation of processes undertaken in learning. According to Suyuti et al. (2023), learning outcomes reflect students' understanding of subject matter, their ability to apply concepts in daily life, and their skills in problem-solving. Yuniwati and Masruri (2016) state that good learning outcomes can reflect strong learning processes and understanding of subject matter. This encompasses not only academic grade improvements but also critical thinking development and problem-solving skills. Learning outcome achievement is not limited to academic grades alone but also includes students' abilities in independent thinking, collaboration, and adaptation to real-world challenges.

However, various problems related to learning outcomes still exist in practice. Many students experience difficulties in achieving established learning standards. Problems related to low student learning outcomes also occur at SMK Negeri 1 Surakarta in the Office Management and Business Services (MPLB) program for Grade X students in Basic Vocational Subjects. Based on preliminary research data, some students still receive grades below minimum standards, reflecting problems in understanding and skills being taught. Based on evaluation results of Grade X MPLB 3 students at SMK Negeri 1 Surakarta in Basic Vocational Subjects, student learning outcomes remain below the Minimum Completeness Criteria (KKM) of 80. In skills aspects, 88% of students obtained grades below KKM, with 35% not proficient, 24% less proficient, and 29% sufficiently proficient. In text formatting skills, 94% of students had not achieved KKM, consisting of 44% not proficient and 50% sufficiently proficient. In image or table insertion aspects, 53% of students received grades below KKM, with 38% not proficient and 15% sufficiently proficient. Meanwhile, in collaboration skills aspects, 82% of students had not achieved KKM, consisting of 32% not proficient and 50% sufficiently proficient. These conditions indicate that student understanding and material mastery remain suboptimal, resulting in low learning outcomes.

Based on several studies, numerous factors influence learning outcomes: teaching methods, learning technology utilization, student guidance and support, teacher quality, and facilities and infrastructure (Setiawan, 2021). Other factors influencing learning outcomes can be internal and external factors (Damayanti, 2022). Internal factors are aspects originating from within individuals,

such as interest, motivation, attention, learning readiness, memory, concentration, and cognitive, affective, and psychomotor abilities. Meanwhile, external factors include family, learning methods, learning environment, teachers, and peers (Anggraini, 2019).

One factor potentially influencing student learning outcomes is the use of AI-based learning technology, where previous research shows that AI has significant potential in improving student learning outcomes by providing more effective, flexible, and engaging learning experiences (Shiva et al., 2024). Research by Tsai et al. (2021) and Agestiningrum and Siswanto (2024) supports these findings. Tsai et al.'s (2021) study shows that AI implementation improves students' concept understanding and problem-solving abilities. Meanwhile, research by Agestiningrum and Siswanto (2024) proves that AI-based learning systems can increase student access to learning materials and learning personalization.

Implementation of AI (Artificial Intelligence)-based learning technology utilization offers great potential for current learning process revolution (Rustan & Junaid, 2024). AI enables learning personalization, increases student engagement, and enriches learning experiences where each student can receive materials and teaching methods adapted to their needs, interests, and learning styles. AI can improve learning effectiveness by providing more accurate assessments and rapid feedback. Additionally, AI can quickly analyze individual student needs and provide more appropriate learning recommendations (Indarta et al., 2022).

Another factor that can influence student learning outcomes is teacher interpersonal communication, which is supported by previous research showing that teacher interpersonal communication has positive impacts on student learning outcomes (Buro, 2017). Similarly, research by Hidayati (2020) found similar results that effective teacher interpersonal communication has positive influence on student learning outcomes. In other words, the better the communication between teachers and students, the higher the likelihood for students to achieve satisfactory results.

Effective teacher interpersonal communication can create stronger bonds between teachers and students, making students feel more motivated and comfortable in the learning process (Yeni & Susanti, 2023). Communication itself is essentially a process of message delivery from communicators to communicants aimed at changing attitudes, opinions, and behaviors (Buro, 2017). Meanwhile, interpersonal communication is communication that is flexible in nature with mutual feedback between one another, where all parties mutually provide and receive input (Kurniawan, 2020).

Based on this background, this research aims to answer several main questions: (1) Does AI-based learning technology influence student learning outcomes in basic vocational subjects at SMK N 1 Surakarta? (2) Does teacher interpersonal communication influence student learning outcomes in basic vocational subjects at SMK N 1 Surakarta? and (3) Do AI-based learning technology and teacher interpersonal communication together influence student learning outcomes in basic vocational subjects at SMK N 1 Surakarta? By answering these questions, this research is expected to provide deeper insights for schools, teachers, students, and other researchers to improve learning quality for SMK students.

## Research Methods

This research employed a quantitative approach with correlational quantitative methods to analyze the influence of AI-based learning technology and teacher interpersonal communication on learning outcomes in Basic Vocational Subjects focusing on Grade X MPLB students at SMK Negeri 1 Surakarta. This research was conducted in seven stages: research preparation, research proposal development, instrument determination and development, data collection, data processing and analysis, conclusion drawing, and research report preparation. The population in this research totaled 103 students, with a sample of 82 Grade X MPLB students at SMK N 1 Surakarta. The sampling technique used was proportional random sampling. This research was conducted offline or directly using Google Forms for questionnaire distribution and documentation related to student names and student learning outcome data.

Data collection techniques were conducted using closed questionnaires based on 5-point Likert scales, where respondents chose answers most appropriate to their conditions. Additionally, student learning outcome data were also collected through documentation. Data analysis techniques

included data tabulation preparation, classical assumption tests (normality, linearity, multicollinearity, and heteroscedasticity tests), and hypothesis testing including multiple linear regression analysis, t-tests, F-tests, and determination coefficients. Researchers also calculated effective and relative contributions to examine each variable's contribution to learning outcomes.

## Results and Discussion

### Research Results

This research used data collection methods through questionnaire distribution for independent variables (X) and grade data from summative assessments for dependent variables (Y). Before use, questionnaires were pilot tested to ensure validity and reliability. This pilot test was conducted by distributing questionnaires to 34 Grade XI Office Management students. Research questionnaires consisted of 20 statements for AI-based learning technology variables ($X_1$). Validity test results showed that 18 statements were declared valid, while 2 statements were invalid. For teacher interpersonal communication variables ($X_2$), questionnaires also consisted of 20 statements, with validity test results showing 19 valid statements and 1 invalid statement. Invalid statements were deleted because other valid statements were available that represented measured aspects. Therefore, only valid statements were used in this research.

Reliability test results showed that questionnaires for each variable had good reliability levels. AI-based learning technology variables ($X_1$) had reliability values of 0.826, while teacher interpersonal communication variables ($X_2$) had reliability values of 0.931. Because both values were greater than 0.60, all questionnaires in this research were declared reliable and usable. Descriptive statistics data from each variable in this research are presented as follows.

Based on data collection results through summative tests in Basic Vocational Subjects at SMK Negeri 1 Surakarta, mean values of 74 were obtained. This variable had maximum values of 90 and minimum values of 48, with value ranges of 42. The total overall scores obtained from student learning outcome totals were 6,104. AI-based learning technology variables consisted of 18 statements with Likert scales 1-5, completed by 82 respondents, obtaining mean values of 68. This variable had maximum values of 86 and minimum values of 52, with value ranges of 34. The total overall scores obtained from all respondents were 5,587. Teacher interpersonal communication variables consisted of 19 statements with Likert scales 1-5, completed by 82 respondents, obtaining mean values of 75. This variable had maximum values of 95 and minimum values of 54, with value ranges of 41. The total overall scores obtained from all respondents were 6,160.

Prerequisite tests used in this research were normality tests, linearity tests, multicollinearity tests, and heteroscedasticity tests. Normality test results showed Asymp. Sig. (2-tailed) values of 0.20, where these values were greater than 0.05. Therefore, obtained significance values > 0.05 indicate that data in this research are normally distributed. Linearity test results between AI-based learning technology ($X_1$) and student learning outcomes (Y) showed significance values in deviation from linearity rows of 0.292. These significance values were greater than 0.05. Therefore, it can be concluded that AI-based learning technology variables and student learning outcomes have linear relationships. Linearity test results between teacher interpersonal communication ($X_2$) and student learning outcomes (Y) showed significance values in deviation from linearity rows of 0.780. These significance values were greater than 0.05. Therefore, it can be concluded that teacher interpersonal communication variables and student learning outcomes have linear relationships. Based on multicollinearity test results, AI-based learning technology variables had tolerance values of 0.77 and VIF values of 1.28. Teacher interpersonal communication variables had tolerance values of 0.77 and VIF values of 1.28. These three variables had tolerance values > 0.10 and VIF values < 10. Therefore, it can be concluded that these three variables do not have multicollinearity symptoms. Heteroscedasticity test calculation results using scatterplot tests in this research showed no specific patterns, and data points were unevenly scattered around zero lines on Y-axes. Table 1 presents the t-test results, which examine the individual or partial influence of independent variables on the dependent variable.

**Table 1**

*T-Test Results*

|  | $T_{calculated}$ | Significance |
|---|---|---|
| (Constant) | 6,999 | ,000 |
| AI-Based Learning Technology | 2,262 | ,026 |
| Teacher Interpersonal Communication | -1,291 | ,201 |

(Source: Data processed by researchers, 2025)

Based on Table 1, t-tests were conducted to determine independent variable influences individually or partially on dependent variables. Based on t-test results, AI-Based Learning Technology variables had significance values of 0.026 < 0.05, besides t-calculated values for this variable being 2.262 > t-table 1.990. This indicates that $H_0$ is rejected and $H_1$ is accepted, so it can be concluded that AI-based learning technology has positive and significant influence on student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta. Subsequently, teacher interpersonal communication variables had significance values of 0.201 > 0.05, with t-calculated values of -1.291 < t-table 1.990. Based on these results, $H_0$ is accepted and $H_2$ is rejected, meaning that teacher interpersonal communication does not have positive and significant influence on student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta. Table 2 presents the F-test results, which examine the simultaneous influence of independent variables on the dependent variable.

**Table 2**
*F-Test Results*

| | Sum of Squares | df | Mean Square | F | Signifikansi |
|---|---|---|---|---|---|
| Regresion | 386,833 | 2 | 193,417 | 2,589 | 0,081b |
| Residual | 5901,362 | 79 | 74,701 | | |
| Total | 6288,195 | 81 | | | |

(Source: Data processed by researchers, 2025)

Based on Table 2, significance values for AI-based learning technology ($X_1$) and teacher interpersonal communication ($X_2$) variables toward student learning outcomes (Y) were 0.081. Because this significance value is smaller than the 0.10 significance level (0.081 < 0.10) and F-calculated values are greater than F-table values of 2.589 (2.589 > 2.370), $H_0$ is rejected and $H_a$ is accepted. Therefore, it can be concluded that AI-based learning technology ($X_1$) and teacher interpersonal communication ($X_2$) together have significant positive influence on student learning outcomes (Y) at 10% significance level. Table 3 presents the multiple linear regression analysis results, providing the regression equation for this study.

**Table 3**
*Multiple Linear Regression Analysis Results*

|  | B | Std. Error | Beta |
|---|---|---|---|
| (Constant) | 63,106 | 9,016 | |
| AI-Based Learning Technology | ,314 | ,139 | ,280 |
| Teacher Interpersonal Communication | -,134 | ,104 | -,160 |

(Source: Data processed by researchers, 2025)

Based on Table 3, the regression equation obtained in this research is:
$$\hat{Y} = 63{,}106 + 0{,}314.X1 - 0{,}134.X2 + e$$
Based on the regression equation above, interpretations can be made as follows: (1) The positive constant of 63.106 indicates that if AI-based learning technology ($X_1$) and teacher

interpersonal communication ($X_2$) equal zero (0), then student learning outcome values (Y) are predicted to be 63.106; (2) The regression coefficient for AI-based learning technology variables ($X_1$) of 0.314 indicates that every increase in AI-based learning technology variables by one unit will result in student learning outcome increases of 0.314, assuming teacher interpersonal communication variables ($X_2$) equal zero (0); (3) The regression coefficient for teacher interpersonal communication variables ($X_2$) of -0.134 can be interpreted that every increase in teacher interpersonal communication by one unit will result in student learning outcome decreases of 0.134, assuming AI-based learning technology variables ($X_1$) equal zero (0). Table 4 presents the coefficient of determination analysis results, showing the proportion of variance explained by the independent variables.

**Table 4**
*Coefficient of Determination Analysis Results*

| R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|
| ,248[a] | ,062 | ,038 | 8,64296 |

(Source: Data processed by researchers, 2025)

Based on Table 4, coefficient of determination (R Square) values are 0.062 or 6.2%, meaning the influence of AI-based learning technology and teacher interpersonal communication on student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta is 6.2%, while the remainder (100% - 6.2% = 93.8%) is influenced by other variables not explained in this research.

## Discussion

### The Impact of AI-Based Learning Technology on Student Learning Outcomes in Basic Vocational Subjects for Grade X MPLB Students at SMK Negeri 1 Surakarta

AI-based learning technology has an impact on student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta. Based on testing results, findings show $H_0$ rejected and $H_1$ accepted. This is supported by t-test results showing t-calculated > t-table (2.262 > 1.990) with significance values of 0.026 < 0.05. Therefore, it can be concluded that AI-based learning technology has positive and significant influence on student learning outcome variables in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta.

This hypothesis aligns with research conducted by Shiva et al. (2024), which explains that AI implementation enables higher completion rates in learning processes, improves learning outcomes, and strengthens information retention. This shows that AI can help students understand materials well through more interactive learning experiences adapted to individual needs. Similar results are found in research by Zawacki et al. (2019), which states that AI can improve student learning outcomes through several mechanisms, such as adaptive learning, automatic evaluation systems, and intelligent tutors. Additionally, AI also plays roles in facilitating more flexible learning, enabling students to learn anytime and anywhere.

AI-based learning technology in this research is based on adaptive learning concepts and intelligent evaluation systems aimed at improving student learning outcomes. AI is used as a learning aid in learning processes, enabling students to search for information, complete assignments, and develop new ideas supporting their understanding of subject materials. Therefore, based on conducted data processing, it can be determined that the higher the AI-based learning technology, the higher student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta.

### The Impact of Teacher Interpersonal Communication on Student Learning Outcomes in Basic Vocational Subjects for Grade X MPLB Students at SMK Negeri 1 Surakarta

Teacher interpersonal communication has an impact on student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta. Based on hypothesis testing results, findings show $H_0$ accepted and $H_1$ rejected. This is supported by t-test results showing

t-calculated < t-table (-1.291 < 1.990) with significance values of 0.201 > 0.05. Therefore, it can be concluded that teacher interpersonal communication does not have positive and significant influence on student learning outcome variables in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta.

Research findings contradict research conducted by Putra et al. (2022), which shows that effective interpersonal communication between teachers and students has positive and significant impacts on student understanding and academic achievement. Additionally, other research by Syahrudin (2022) also reveals that interpersonal communication, both individually and together with other factors like learning motivation, has significant impacts on learning outcomes. However, these research results align with findings by Artaverlina and Wulandari (2021), which state that educator interpersonal communication does not significantly influence student learning outcome variables. These result differences indicate that teacher interpersonal communication is not the main factor determining student learning outcomes in this research.

Research results show that teacher interpersonal communication does not provide significant impacts on student learning outcomes. AI-based learning dominance, high student learning independence, and learning methods more oriented toward technology become other factors that very possibly cause teacher interpersonal communication to not have significant relationships with student learning outcomes in this research.

**The Impact of AI-Based Learning Technology and Teacher Interpersonal Communication on Student Learning Outcomes in Basic Vocational Subjects for Grade X MPLB Students at SMK Negeri 1 Surakarta**

AI-based learning technology and teacher interpersonal communication variables simultaneously have positive and significant influences on student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta. These findings are supported by F-test results, where F-calculated values are greater than F-table (2.589 > 2.370) with significance values of 0.081 below the 0.10 threshold. Therefore, $H_o$ is rejected and $H_a$ is accepted, indicating that simultaneously AI-based learning technology and teacher interpersonal communication contribute to student learning outcome improvements in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta.

Coefficient of determination analysis results show R square values of 0.062, indicating that AI-based learning technology and teacher interpersonal communication variables contribute 6.2% to student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta. Meanwhile, 93.8% of variations in student learning outcomes are influenced by other factors not included in this research. Additionally, based on effective contribution analysis results, AI-based learning technology contributions to student learning outcomes are 5.8%, while teacher interpersonal communication has contributions of 0.4%. These findings show positive relationships between AI-based learning technology implementation and teacher interpersonal communication with student learning outcome improvements in Basic Vocational Subjects.

Based on these findings, conclusions are strengthened that AI-based learning technology implementation and teacher interpersonal communication simultaneously play roles in improving student learning outcomes. Testing data results show that if students receive optimal AI-based learning technology, students will more easily understand subject materials, increase learning independence, and obtain better learning outcomes. Additionally, if teacher interpersonal communication is optimal, students will feel more supported in learning processes, more motivated, and have deeper understanding of taught materials. Good interactions between teachers and students can create more comfortable learning atmospheres, increase student involvement in discussions, and help them overcome learning difficulties. Therefore, the more optimal AI-based learning technology implementation and teacher interpersonal communication in learning processes, the higher the potential for student learning outcome improvements in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta.

## Conclusion

Based on successfully collected data and conducted analyses, conclusions that can be stated are: (1) There is positive and significant influence of AI-based learning technology on student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta. Conducted data analysis results obtained significance values of 0.026, meaning not more than 0.05, indicating influence. Therefore, the better AI-based learning technology used by students, the higher student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta; (2) There is no positive and significant influence of teacher interpersonal communication on student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta. Conducted data analysis results obtained significance values of 0.201, meaning more than 0.05, indicating no influence. These findings show that every increase in teacher interpersonal communication will result in decreases in student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta; and (3) There is positive significant simultaneous influence between AI-based learning technology and teacher interpersonal communication with student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta. This is proven by significance values of $0.081 < 0.10$. Additionally, R square results are 0.062. Other factors not studied in this research amount to 93.8%. Furthermore, effective contribution calculation results for AI-based learning technology variables $(X_1)$ to student learning outcomes (Y) are 5.8%, while teacher interpersonal communication $(X_2)$ contributes 0.4%. For relative contribution calculation results, AI-based learning technology variables $(X_1)$ to student learning outcomes (Y) are 93%, and relative contributions of teacher interpersonal communication variables $(X_2)$ to student learning outcomes (Y) are 7%. Therefore, the more optimal AI-based learning technology implementation and teacher interpersonal communication in learning processes, the higher the potential for student learning outcome improvements in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta. AI-based learning technology is more dominant compared to teacher interpersonal communication in influencing student learning outcomes in Basic Vocational Subjects for Grade X MPLB students at SMK Negeri 1 Surakarta.

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# The influence of internal locus of control and parental socioeconomic status on students' work readiness

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***Abstrak***

*Penelitian ini bertujuan untuk mengetahui: (1) pengaruh internal locus of control terhadap kesiapan kerja siswa kelas XII MPLB SMK N 1 Sukoharjo, (2) pengaruh status sosial ekonomi orang tua terhadap kesiapan kerja siswa kelas XII MPLB SMK Negeri 1 Sukoharjo, (3) pengaruh internal locus of control dan status sosial ekonomi orang tua terhadap kesiapan kerja siswa kelas XII MPLB SMK Negeri 1 Sukoharjo. Penelitian ini menggunakan metode kuantitatif dengan populasi siswa kelas XII MPLB SMK N 1 Sukoharjo dan sampel sebanyak 84 siswa yang diperoleh dengan teknik probability sampling. Analisis data menggunakan analisis regresi berganda. Hasil penelitian menunjukkan: (1) internal locus of control berpengaruh positif dan signifikan terhadap kesiapan kerja ($t_{hitung}$ 9.047 > $t_{tabel}$ 1.992) dan nilai signifikansi (0.00 < 0.05), (2) status sosial ekonomi orang tua tidak berpengaruh terhadap kesiapan kerja ($t_{hitung}$ -1.695 < $t_{tabel}$ 1.992 ) dan nilai signifikansi (0.094 > 0.05), (3) internal locus of control dan status sosial ekonomi orang tua secara simultan berpengaruh positif dan signifikan terhadap kesiapan kerja ($F_{hitung}$ sebesar 42.171> $F_{tabel}$ 3.109) dan nilai signifikansi (0.00 < 0.05). Variabel bebas memberikan pengaruh terhadap variabel terikat sebesar 51% dan sisanya 49% dipengaruhi oleh variabel lain di luar penelitian.*

*Kata kunci: kendali diri; kondisi ekonomi keluarga; kuantitatif*

**Abstract**

This study aims to determine: (1) the influence of internal locus of control on work readiness among Grade XII Office Management and Business Services (MPLB) students at SMK N 1 Sukoharjo; (2) the influence of parental socioeconomic status on work readiness among Grade XII MPLB students at SMK Negeri 1 Sukoharjo; and (3) the combined influence of internal locus of control and parental socioeconomic status on work readiness among Grade XII MPLB students at SMK Negeri 1 Sukoharjo. This research employed quantitative methods with a population of Grade XII MPLB students at SMK N 1 Sukoharjo and a sample of 84 students obtained through probability sampling techniques. Data analysis utilized multiple regression

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analysis. Results demonstrate: (1) internal locus of control has a positive and significant effect on work readiness (t-calculated 9.047 > t-table 1.992) with significance value (0.00 < 0.05); (2) parental socioeconomic status does not influence work readiness (t-calculated -1.695 < t-table 1.992) with significance value (0.094 > 0.05); and (3) internal locus of control and parental socioeconomic status simultaneously have positive and significant effects on work readiness (F-calculated 42.171 > F-table 3.109) with significance value (0.00 < 0.05). Independent variables contribute 51% influence on the dependent variable, while the remaining 49% is influenced by other variables outside this research.

## Introduction

Education is a learning process aimed at developing individual potential in intellectual, emotional, social, and moral aspects. In realizing a good educational system, various educational institutions exist to develop student potential. Vocational High Schools (SMK) represent formal educational institutions within the Ministry of Education. According to the National Education System Law Article 18, SMK is secondary education that prepares students to work in specific fields. SMK emphasizes developing student competencies for entering the workforce, including adaptation abilities, identifying work opportunities, and optimally developing self-potential.

SMK outputs are expected to possess specific professional competencies and be ready to contribute to the workforce. However, gaps frequently exist between ideal conditions and field realities, where many SMK students have not been able to plan their career directions (Fadli et al., 2017). Based on data from Statistics Indonesia in 2024, the working population aged 15 years and above by education level for the 2023-2024 period shows fluctuations in SMK graduate absorption into the workforce. Absorption in February 2023 totaled 15.6 million people, August 2023 absorption totaled 17.3 million people, and February 2024 absorption totaled 17.1 million people. Meanwhile, SMK graduate unemployment rates in February 2024 reached 9.4% or 1.6 million people. This high unemployment rate illustrates gaps between workforce needs and labor availability.

Work readiness of graduates, particularly from SMK, becomes a primary expected factor. SMK is viewed as an institution designed to develop specific competencies that prepare students for industry needs to be work-ready, whether working independently or filling existing job vacancies. Zulaehah et al. (2018) state that work readiness is essential for students so they can immediately obtain employment according to their goals in choosing SMK. Work readiness is viewed as efforts to establish individuals in preparing themselves regarding knowledge, skills, attitudes, and values needed. Students who possess work readiness can potentially work immediately without requiring long adjustment periods. High or low work readiness can be observed from the duration of obtaining employment and job suitability with areas of expertise.

According to Kartini (as cited in Krisnamurti, 2017), factors influencing student work readiness originate from internal (students themselves) and external (outside influences). Internal factors consist of intelligence, skills and capabilities, talents, abilities and interests, motivation, health, psychological needs, personality, aspirations, and work objectives, while external factors include family environment, work environment, work tranquility, promotion opportunities, colleagues, leadership, and salary.

Student work readiness is driven from within students themselves, where they are confident in their abilities and skills to compete in the workforce. Confidence in self-ability that can influence work readiness is internal locus of control. This factor represents beliefs held by individuals that

their abilities, expertise, and efforts determine the results they obtain. Besides internal locus of control as internal factors influencing student work readiness, external factors are also suspected to influence student work readiness. The external factor referred to is parental socioeconomic status.

Work readiness represents a measure of student success in preparing themselves to enter the workforce suitable to student abilities. Work readiness is suspected to be influenced by several factors, namely internal and external factors including internal locus of control and parental socioeconomic status. Therefore, this research is important to conduct to understand student work readiness. Researchers are interested in conducting research on the topic of internal locus of control and parental socioeconomic status influence on student work readiness.

Work readiness determines individuals in improving their work abilities encompassing knowledge, expertise, and individual attitudes (Irawan & Hendri, 2022). Muspawi and Lestari (2020) define work readiness as conditions of physical maturity, mental maturity, and individual learning experiences that align to perform chosen work. Work readiness is influenced by factors from within oneself (internal) and factors from outside oneself (external) (Kartini, as cited in Aditiya, 2021). Internal factors include intelligence, skills and capabilities, talents, abilities, personality, and aspirations, while external factors include family environment, work environment, colleagues, relationships with leadership, and salary.

Internal locus of control represents beliefs that every event occurring to individuals is caused by factors within themselves (Annisa et al., 2021). Such individuals believe that every action will influence their lives and tend to feel capable of controlling every action to achieve their goals. Additionally, individuals with internal locus of control tend to have high self-confidence in determining their life directions. Someone with great potential in determining life direction, whether supported by environment or not, believes they can face existing challenges and threats (Oktavian et al., 2023).

According to Taluke (2021), parental socioeconomic status relates to individual or family positions and dignity in society and efforts to create goods and services for fulfilling both physical and spiritual needs. According to Dimyati Mahmud (as cited in Synthiawati et al., 2021), parental socioeconomic status includes education levels, job types and income, positions, special facilities, and valuable goods.

## Research Methods

This research was conducted at SMK N 1 Sukoharjo, located at Jalan Jend. Sudirman No. 151, Gabusan, Jombor, Bendosari District, Sukoharjo Regency, Central Java. This research employed quantitative causal research methods. Causal comparative methods are used in evaluation to determine possible cause-and-effect relationships (Abdullah et al., 2022). This method was used to determine the influence of independent variables internal locus of control $(X_1)$ and parental socioeconomic status $(X_2)$ on work readiness $(Y)$ as dependent variables. The population in this research consisted of Grade XII MPLB students at SMK N 1 Sukoharjo. In this research, sampling used the Slovin formula, obtaining a sample of 84 students.

Data collection techniques in this research utilized closed questionnaires where researchers provided answers and alternative answers. Questionnaires in this research consisted of two types used to obtain information: closed questionnaires with modified Likert scales for work readiness and internal locus of control variables, and closed multiple-choice questionnaires for parental socioeconomic status variables. Likert scales are used to measure attitudes, opinions, and perceptions of individuals or groups about social phenomena (Sugiyono, as cited in Satria & Imam, 2024), making them suitable for measuring respondent beliefs, while multiple choice tests are objective tests consisting of statements that must be completed by selecting one answer (Sudjiono, as cited in Roza & Maemonah, 2022), making them suitable for measuring conditions truly matching respondent situations.

Internal locus of control in this research was measured using indicators proposed by Agung and Ratnawili (2020): (1) Everything achieved results from personal efforts; (2) Becoming a leader due to personal abilities; (3) Achieving success through effort and hard work; (4) Individual ability to determine events occurring in life; (5) Individual life determined by personal action choices; and (6) Failure due to personal actions. Parental socioeconomic status used indicators of parental

education, occupation, income, and property ownership. Work readiness in this research used indicators from Rahmawati et al. (2019): (1) Having logical and objective considerations; (2) Having abilities to work with others; (3) Having self-control abilities; (4) Having critical attitudes; (5) Having responsibility; (6) Having environmental adaptation abilities; and (7) Having ambitions for advancement.

Before questionnaires were distributed to respondents, questionnaires were first piloted through validity and reliability tests with 20 respondents also from Grade XII Office Management and Business Services outside the sample. From data obtained from pilot instruments, it was determined that the internal locus of control variable ($X_1$) had 11 valid statements from 18 statements and 7 invalid statements. The parental socioeconomic status variable ($X_2$) had 7 valid statements from 9 statements and 2 invalid statements. The work readiness variable (Y) had 15 valid statements from 21 statements and 6 invalid statements. Cronbach's Alpha values were obtained for internal locus of control variables ($X_1$) of 0.755, parental socioeconomic status variables ($X_2$) of 0.741, and work readiness variables of 0.809, so it can be concluded that these instruments are reliable. From valid and reliable statements, questionnaires were then compiled for research use.

In this research, collected data underwent prerequisite analysis tests including normality tests, linearity tests, multicollinearity tests, and heteroscedasticity tests. Hypothesis testing was conducted using multiple linear regression, t-tests, F-tests, determination coefficients, and effective and relative contributions.

## Results and Discussion

### Research Results

This research consisted of two independent variables: internal locus of control and parental socioeconomic status, and one dependent variable: work readiness. Research was conducted in Grade XII MPLB classes at SMK N 1 Sukoharjo by distributing questionnaires to 84 respondents. Before questionnaire distribution, questionnaires were first piloted to determine reliability and validity.

Normality tests were used to determine whether data were normally distributed using Kolmogorov-Smirnov formulas. Data are considered normal when significance > 0.05. In this research, normality tests showed significance values of 0.200 > 0.05, so data can be considered normally distributed. Linearity tests in this research used deviation from linearity values. Models are considered to have linear relationships when significance values > 0.05. Table 1 presents the linearity test results for both independent variables.

**Table 1**
*Linearity Test Results*

|  | Sig | | |
|---|---|---|---|
|  | F | *Deviation    for Linearity* | Description |
| Internal Locus of Control and Work Readiness | 1,760 | 0.068 | Linear |
| Parental Socioeconomic Status and Work Readiness | 0,867 | 0,597 | Linear |

Based on linearity test results in Table 1, Internal Locus of Control significance values were 0.068 and Parental Socioeconomic Status were 0.597, both greater than 0.05, so both variables can be declared linear. Multicollinearity tests were used to determine relationships between independent variables. In multicollinearity tests, decisions can be made by observing Tolerance values and Variance Inflation Factor (VIF) values. When Tolerance values are greater than 0.10, multicollinearity does not occur in models. Additionally, when VIF values are less than 10.00, models are not indicated to have multicollinearity. Table 2 presents the multicollinearity test results.

**Table 2**
*Multicollinearity Test Results*

|  | Collinearity Statistics | | Description |
|---|---|---|---|
|  | *Tolerance* | VIF |  |
| Internal Locus of Control | 1.000 | 1.000 | No multicollinearity |
| Parental Socioeconomic Status | 1.000 | 1.000 | No multicollinearity |

Based on multicollinearity test results in Table 2, Tolerance values were 1.000 and VIF values were 1.000, so this regression model does not experience multicollinearity symptoms. T-tests aimed to determine the presence or absence of influence between each independent variable and dependent variables. Independent variables can be considered influential when t-calculated > t-table and significance values < 0.05. Table 3 presents the partial hypothesis test results.

**Table 3**
*T-Test Results*

|  | Unstandardized Coefficients | | Standardized Coefficients |  |  |
|---|---|---|---|---|---|
|  | B | *Std. Error* | Beta | t | Sig. |
| (Constant) | 18.282 | 3.943 |  | 4.636 | .000 |
| Internal Locus of Control | .906 | .100 | .704 | 9.047 | .000 |
| Parental Socioeconomic Status | -.177 | .104 | -.132 | -1.695 | .094 |

Based on Table 3, internal locus of control variables ($X_1$) had t-calculated values of 9.047, greater than t-table values at 0.025 significance level (two-sided) of 1.992, and significance values of 0.00, smaller than 0.05. From these results, it is concluded that Internal Locus of Control influences Student Work Readiness at SMK Negeri 1 Sukoharjo. Meanwhile, Parental Socioeconomic Status variables ($X_2$) had t-calculated values of -1.695 and probability values of 0.094. Because t-calculated values are negative and smaller than t-table values of 1.992, and probability values are greater than 0.05, $H_0$ is accepted and $H_a$ is rejected, so it can be concluded that Parental Socioeconomic Status does not influence Student Work Readiness at SMK Negeri 1 Sukoharjo. The next hypothesis test was the F-test to determine simultaneous influence of independent variables on dependent variables. Independent variables can be considered to have simultaneous influence when F-calculated > F-table and significance values < 0.05. Table 4 presents the simultaneous hypothesis test results.

**Table 4**
*F-Test Results*

|  | *Sum of Squares* | f | *Mean Square* | F | Sig. |
|---|---|---|---|---|---|
| *Regression* | 731.828 | 2 | 365.914 | 42.171 | .000[b] |
| *Residual* | 702.838 | 81 | 8.677 |  |  |
| Total | 1434.667 | 83 |  |  |  |

Based on Table 4, F-calculated values were 42.171, greater than F-table values of 3.109, and probability values were 0.00, smaller than 0.05. From these results, it can be concluded that there are positive and significant influences of internal locus of control and parental socioeconomic status together on student work readiness at SMK Negeri 1 Sukoharjo. Multiple linear regression analysis was used to understand the direction of influence of two or more independent variables on one dependent variable. Table 5 presents the multiple linear regression analysis results.

**Tabel 5**
*Multiple Linear Regression Analysis Results*

| | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | t | Sig. |
| (Constant) | 18.282 | 3.943 | | 4.636 | .000 |
| Internal Locus of Control ($X_1$) | .906 | .100 | .704 | 9.047 | .000 |
| Parental Socioeconomic Status ($X_2$) | -.177 | .104 | -.132 | -1.695 | .094 |

Based on Table 5, the regression equation is $\hat{Y} = 18.282 + 0.906X_1 - 0.177X_2$. The value 18.282 represents the constant value stating work readiness magnitude when Internal Locus of Control variables ($X_1$) and Parental Socioeconomic Status variables ($X_2$) equal 0. The regression coefficient $X_1 = 0.906$ states that every one-unit increase in Internal Locus of Control variables ($X_1$) will increase work readiness by 0.906 units. The regression coefficient $X_2 = -0.177$ states that every one-unit increase in Parental Socioeconomic Status variables ($X_2$) will decrease work readiness by -0.177 units. Determination coefficient analysis was used to determine the magnitude of influence of all independent variables on dependent variables. Table 6 presents the determination coefficient test results.

**Table 6**
*Determination Coefficient Analysis Results*

| R | R Square | Adjusted Square | RStd. Error of the Estimate |
|---|---|---|---|
| .714[a] | .510 | .498 | 2.946 |

In Table 6, R Square values were 0.510 or 51%, meaning work readiness of Grade XII Office Management and Business Services students at SMK Negeri 1 Sukoharjo is 51% influenced by Internal Locus of Control and Parental Socioeconomic Status variables, while the remaining 49% is influenced by other variables not studied. Effective contribution shows how much contribution independent variables make to dependent variables in regression analysis. Table 7 presents effective contribution results.

**Table 7**
*Effective Contribution Results*

| Variable | Value |
|---|---|
| Internal Locus of Control ($X_1$) | 0,704 x 0,702 x 100% = 49,42% |
| Parental Socioeconomic Status ($X_2$) | - 0,132 x – 0,123 x 100% = 1,62% |
| Total | 51,0% |

Based on Table 7, effective contributions of Internal Locus of Control ($X_1$) to Work Readiness (Y) were 49.42%, and effective contributions of Parental Socioeconomic Status ($X_2$) to Work Readiness (Y) were 1.62%. The total of both variables is 51% or equal to R Square values. Relative contribution is the percentage comparison given by independent variables to dependent variables. Table 8 presents relative contribution results.

**Table 8**
*Relative Contribution Results*

| Variabel | Value |
|---|---|
| Internal Locus of Control ($X_1$) | 49,42/ 51,0% = 96,90% |
| Parental Socioeconomic Status ($X_2$) | 1,62 / 51,0% = 3,18% |
| Total | 100% |

Based on Table 8, relative contributions of Internal Locus of Control ($X_1$) to Work Readiness (Y) were 96.90%, and effective contributions of Parental Socioeconomic Status ($X_2$) to Work Readiness (Y) were 3.18%. The total of both variables is 100%.

**Discussion**

Based on regression test results, internal locus of control has positive and significant influence on work readiness, shown by significance values obtained for internal locus of control variables of 0.00 < 0.05 and t-calculated values of 9.047 > t-table 1.992. Based on internal locus of control questionnaire results, the highest scores were obtained on item number 4 with values of 297 containing the statement "I feel that my hard work in learning will produce good results." Students who believe that hard work and learning will produce good results will strive maximally so their skills for facing the workforce become more ready and trained. Meanwhile, the lowest scores were on item number 3 with values of 238 containing the statement "I cannot set clear and realistic goals for myself." This shows that students have not been able to set clear goals for themselves. Inability to set clear and realistic goals can hinder student self-development directions, thus reducing their readiness to face the workforce.

Research results align with research by Riswati et al. (2021), which states that internal locus of control positively influences student work readiness. High internal locus of control increases work readiness within students to face the workforce. Internal locus of control formation will foster student enthusiasm for learning field-appropriate matters to improve work readiness. Additionally, this research strengthens research by Kusumaningsih et al. (2023), showing that individuals with internal control tend to demonstrate greater work readiness for entering the workforce. Internal locus of control development can potentially increase work readiness and success opportunities in job markets.

Based on regression test results, parental socioeconomic status does not influence work readiness, shown by significance values obtained for parental socioeconomic status variables of 0.094 > 0.05 and t-calculated values of -1.695 < t-table 1.992. Research results show that parental socioeconomic status for most students is in moderate categories, shown by the highest frequency of 50 students in moderate categories, 27 students in low categories, and 7 students in high categories. This shows that generally parents have sufficient economic conditions to meet student basic needs, including education. This means differences in parental socioeconomic status, whether low, moderate, or high, do not directly influence student work readiness for facing the workforce.

Research results align with research by Khairunnisa and Trisnawati (2024), which states there is no significant influence of parental socioeconomic status on work readiness. Work readiness is not solely influenced by parental socioeconomic conditions. Although parents with high socioeconomic status have greater access to educational facilities, this does not guarantee work readiness without direct encouragement from students themselves. Factors influencing work readiness originate from students themselves. When students feel work readiness is important for them, students will strive to improve their work readiness through additional courses or training. Additionally, parental socioeconomic status does not become barriers to accessing learning support facilities because SMK Negeri 1 Sukoharjo has provided facilities students can use to support learning and prepare for facing the workforce. Therefore, schools have anticipated student economic background gaps to develop their abilities. Research results contrast with research by Wahyuningsih and Yulianto (2020), Arwani (2017), and Manik (2023), which state significant influences between parental socioeconomic status and work readiness.

Furthermore, there are influences of internal locus of control and parental socioeconomic status together on student work readiness, shown by F-tests showing significance values of 0.000 < 0.05 and F-calculated values of 42.171 > F-table 3.109. This indicates that higher student internal locus of control and better parental socioeconomic status can improve student work readiness. Rahmawati et al. (2019) state that student work readiness is influenced by two factors: internal and external. Internal factors include self-confidence in viewing life events or internal locus of control. Students with high internal locus of control tend to believe that results they obtain depend on their own efforts and decisions. This belief encourages them to plan after graduation, seek internship opportunities or competency certifications, and develop attitudes and skills for entering the

workforce. Besides internal factors, external factors exist, including parental socioeconomic status. Students from families with good socioeconomic status may have greater access to educational resources and self-development opportunities. Both independent variables contribute 51% to dependent variables, so many other factors are suspected to influence student work readiness besides internal locus of control and parental socioeconomic status.

## Conclusion

Based on research data results, conclusions can be drawn that there are positive and significant influences of internal locus of control on work readiness. This can be seen from significance values obtained for internal locus of control variables of 0.00 < 0.05 and t-calculated values of 9.047 > t-table 1.992. There is no influence of parental socioeconomic status on work readiness. This can be seen from significance values obtained for parental socioeconomic status variables of 0.094 > 0.05 and t-calculated values of -1.695 < t-table 1.992. There are influences of internal locus of control and parental socioeconomic status together on student work readiness. This can be seen from F-tests showing significance values of 0.000 < 0.05 and F-calculated values of 42.171 > F-table 3.109. In this research process, limitations may influence research results: (1) Limited research time, energy, and researcher capabilities; (2) Limited respondent abilities in understanding questionnaire statements and honesty in completing questionnaires; and (3) Research objects limited to Office Management and Business Services departments, which is only one of many departments in SMK. Determination coefficient results show values of 51.0%, meaning work readiness is influenced by internal locus of control and parental socioeconomic status by 51.0%. Therefore, future researchers are expected to study other variables related to work readiness because 49% of other factors are not included in this research.

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# Factors influencing vocational students' interest in pursuing higher education

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### Abstrak

*Penelitian ini bertujuan untuk mengetahui: (1) minat siswa SMK Batik 2 Surakarta dalam melanjutkan ke jenjang pendidikan tinggi; (2) faktor internal dan eksternal yang memengaruhi minat siswa SMK dalam melanjutkan ke jenjang pendidikan tinggi; (3) kendala yang dihadapi siswa dalam melanjutkan ke jenjang pendidikan tinggi. Penelitian ini menggunakan pendekatan kualitatif dengan desain studi kasus yang dilaksanakan di SMK Batik 2 Surakarta. Informan penelitian berjumlah 15 orang yang terdiri dari siswa kelas XII jurusan Manajemen Perkantoran dan Layanan Bisnis, guru, serta orang tua siswa yang dipilih melalui teknik purposive sampling. Data dikumpulkan melalui wawancara mendalam, observasi terhadap kegiatan belajar mengajar dan lingkungan sekolah, serta analisis dokumen terhadap data alumni sekolah dan kajian terdahulu yang relevan. Uji validitas data dengan triangulasi sumber, waktu, dan metode, serta member checking. Teknik analisis data menggunakan model Miles dan Huberman yang terdiri dari tahap pengumpulan data, reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian menunjukkan bahwa: (1) minat siswa SMK Batik 2 Surakarta dalam melanjutkan ke jenjang pendidikan tinggi menunjukkan keberagaman, beberapa diantaranya memilih melanjutkan pendidikan tinggi dan ada pula yang cenderung memutuskan bekerja setelah lulus; (2) minat siswa untuk melanjutkan pendidikan tinggi dipengaruhi oleh faktor internal (motivasi pribadi dan prestasi belajar) serta faktor eksternal (lingkungan sosial, dan keterkaitan antara jurusan SMK dengan program studi di perguruan tinggi); (3) kendala yang dihadapi siswa dalam melanjutkan pendidikan tinggi antara lain, keterbatasan finansial keluarga dan rendahnya efikasi diri dalam menghadapi tantangan akademik.*

*Kata kunci: faktor eksternal dan internal; kualitatif; minat; siswa SMK; studi lanjut*

### Abstract

This study aims to investigate: (1) the interest of students at SMK Batik 2 Surakarta in pursuing higher education; (2) the internal and external factors influencing vocational high school students' interest in continuing to higher education; and (3) the obstacles students face in pursuing higher education. This research employed a qualitative approach with a case study design conducted at SMK Batik 2 Surakarta.

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The study involved 15 informants consisting of Grade XII students majoring in Office Management and Business Services, teachers, and parents, selected through purposive sampling. Data were collected through in-depth interviews, observations of teaching and learning activities and school environment, and document analysis of alumni records and relevant previous studies. Data validity was ensured through source, time, and method triangulation, along with member checking. Data analysis utilized the Miles and Huberman interactive model, comprising data collection, data reduction, data display, and conclusion drawing. Results indicate that: (1) students at SMK Batik 2 Surakarta demonstrate diverse interests in pursuing higher education—some choose to continue their studies while others tend to enter the workforce after graduation; (2) students' interest in pursuing higher education is influenced by internal factors (personal motivation and academic achievement) and external factors (social environment and alignment between vocational programs and higher education study programs); and (3) obstacles students face in pursuing higher education include family financial constraints and low self-efficacy in facing academic challenges.

Keywords: higher education aspirations; internal and external factors; qualitative; student interest; vocational high school

## Introduction

Education serves as the primary means of developing skills and abilities of a nation's future generations to form competent and competitive individuals, particularly in an increasingly competitive era of globalization. One pathway of formal education in Indonesia is Vocational High School (SMK), positioned at the secondary level with a focus on developing practical and technical skills to prepare graduates for direct entry into the workforce. SMK is designed to produce skilled workers who meet labor market needs. However, continuous industrial development demands higher skill levels, making higher education an important necessity for expanding knowledge and enhancing graduate potential.

According to SMK's primary objectives, students are expected to possess practical competencies suitable for workforce needs. In accordance with Law Number 20 of 2003 concerning the National Education System, Article 15 states that "Vocational education is secondary education that prepares students primarily to work in specific fields." This emphasizes that SMK has a primary orientation toward preparing students for workforce entry. Nevertheless, some students have begun viewing higher education as a means to develop career opportunities and enhance their professional capabilities. This phenomenon indicates a shift in interest, as increasing numbers of SMK students consider pursuing higher education.

Based on recent surveys conducted by the Directorate General of Vocational Education, Ministry of Education, Culture, Research, and Technology (2024), there has been a significant increase in SMK students' interest in continuing education to higher institutions, reflecting awareness of higher education's importance in facing workforce challenges. In 2024, the number of SMK students registering for the National Selection Based on Achievement (SNBP) increased to 162,156, compared to 153,446 students in 2023. However, despite generally increasing interest in higher education, data show that SMK students still face various obstacles, such as economic constraints, limited information about higher institutions, and pressure to work immediately to support families. This reality is evident among students at SMK Batik 2 Surakarta, where only a small portion of students continue to higher education, while others choose to work directly or become entrepreneurs.

Based on data from SMK Batik 2 Surakarta, in the past two years, only a small portion of alumni continued to higher education. In the 2022/2023 academic year, only 11% of students chose to continue education to higher institutions out of 168 students, experiencing a slight decrease in the 2023/2024 academic year to 4% out of 158 graduating students. One cause of this declining interest is the imbalance between the number of job opportunities and the number of SMK graduates. Additionally, competition with higher education graduates who possess higher qualifications causes SMK graduates to be often considered lacking qualifications and merely as second-tier skilled workers (Fadllilah & Mulyeni, 2023). This fact indicates a gap between the ideal potential of SMK graduates, who should be able to continuously improve their competencies through higher education, and the reality that most choose to work directly without continuing education. This phenomenon suggests the need for in-depth research to understand factors influencing SMK students' interest in continuing to higher education, particularly at SMK Batik 2 Surakarta.

Various studies have been conducted to examine students' interest in continuing to higher education by identifying factors influencing student decisions. Setiawan (2018) states that students' interest in continuing higher education is influenced by two main factors: internal factors including personal motivation to increase knowledge and skills, and external factors including family economic support and social environment influence (family, peers, and teachers). Febryanti et al. (2023) add that internal factors such as personal motivation, needs, and student academic achievement have close relationships with students' interest in pursuing higher education. Meanwhile, external factors consist of parental support, economic conditions, and environmental influences that provide students with confidence and greater opportunities to continue education. In research by Wardani and Susantiningrum (2024), students' interest in continuing higher education is influenced by complex combinations of economic factors, academic achievement, and social environment.

Previous research reveals that combinations of internal and external factors play important roles in influencing students' interest in continuing higher education. However, limitations remain in understanding how these factors interact in specific contexts, particularly at SMK Batik 2 Surakarta, especially among Grade XII students in the Office Management and Business Services program. Therefore, this research aims to fill this gap by exploring in-depth the factors influencing students' interest in continuing to higher education at this location.

This research has a more specific focus, particularly at SMK Batik 2 Surakarta, to identify factors influencing students' interest in continuing to higher education. Several main factors receiving attention in this research include personal motivation, student academic achievement, social environment support, and alignment between SMK vocational programs and major choices in higher education. Personal motivation serves as the primary driver for students to continue to higher education. Additionally, student academic achievement also plays important roles in education continuation decisions, as students with good academic performance tend to feel more prepared and confident to continue education to higher institutions (Feryani et al., 2022). Although social environments including family, school, and community support have great potential in motivating students, many students may not receive adequate support, thus affecting their interest in continuing studies to higher institutions (Nandasari et al., 2019).

Furthermore, alignment between vocational programs taught in SMK and major choices in higher institutions also becomes an important factor. When major choices in higher institutions do not align with skills acquired in SMK, students may feel less interested or confident in continuing higher education. Therefore, this research is very important for exploring how these factors interact at SMK Batik 2 Surakarta. This research is expected to fill gaps in previous research and provide more relevant contributions to future educational policy development.

As part of efforts to improve human resource quality in Indonesia, higher education plays important roles in providing skills and knowledge needed to face increasingly competitive workforce challenges. However, as seen at SMK Batik 2 Surakarta, the still low percentage of SMK students continuing higher education indicates challenges requiring special attention. With this background, this research aims to understand how SMK students' interest in continuing higher education is formed, explore internal and external factors influencing this interest, and identify obstacles students face in continuing to higher education.

## Research Methods

The research was conducted at SMK Batik 2 Surakarta, located at Jalan Sere I, Pajang, Laweyan District, Surakarta City, Central Java. Research activities took place from March to April 2025. This research employed descriptive methods with qualitative approaches. Descriptive methods aim to describe situations or events or provide clear understanding of phenomena by emphasizing systematic, precise, and accurate fact presentation. This research uses qualitative data, describing and analyzing in-depth a phenomenon, namely factors influencing SMK students' interest in continuing higher education. This research aims to determine factors influencing SMK students' interest in continuing to higher education in specific contexts, particularly at SMK Batik 2 Surakarta, especially among Grade XII students in the Office Management and Business Services program.

The sampling technique used was purposive sampling, a nonprobability sampling technique where sample selection for data sources was conducted by considering various criteria related to research topics (Sugiyono, 2015). Data sources in this research consisted of primary and secondary data. Primary data involved 15 informants consisting of Grade XII MPLB students at SMK Batik 2 Surakarta serving as key informants who experienced decision-making processes for continuing higher education, and school personnel and student parents as supporting informants to provide perspectives on family and school support. Secondary data in this research were collected through documentation processes from school documents, higher education-related statistics, and written references still related to research topics.

Data were collected through in-depth interviews, observations of school environment activities related to interest in continuing higher education, and document analysis of alumni school data and relevant previous studies. To ensure data validity, triangulation techniques (comparing different sources, times, and methods) and member checking were employed. Data analysis techniques used the Miles and Huberman model consisting of data collection, data reduction, data display, and conclusion drawing stages.

## Results and Discussion

### Research Results

Interest can be defined as attraction to paying full attention to something, thus forming motivation to achieve something toward objects or activities. Students' interest in continuing to higher education not only serves as motivation for students to continue higher education but also becomes a foundation for achieving success according to their expectations.

SMK Batik 2 Surakarta students' interest in continuing to higher education is also reflected in alumni data recorded in school archives. In the 2022/2023 academic year, only 11% of students chose to continue education to higher institutions out of 168 students, experiencing a slight decrease in the 2023/2024 academic year to 4% out of 158 graduating students. Although the numbers do not show high trends, this reflects changes in SMK Batik 2 Surakarta students' perceptions about the importance of higher education as future investment. This interest development reflects growing perception changes among SMK students, beginning from direct work orientation to awareness of higher education's importance as future investment.

Through analysis of interview results, field observations, and school documents, SMK Batik 2 Surakarta students' interest in continuing to higher education has begun developing positively. This shows that interest not only motivates students in continuing higher education but becomes a foundation for achieving success according to their expectations. Individual interest does not emerge spontaneously but is influenced by various factors that become key elements in achieving goals. Factors influencing students' interest in continuing higher education consist of factors from within individuals called internal factors and factors originating from outside individuals called external factors.

Interest in continuing to higher education is influenced by internal factors originating from within students. One such internal factor is personal motivation, sourced from desires to realize aspirations, improve living standards, and make families proud. This is demonstrated by student

opinions stating, "My motivation is certainly that I can get higher education, then also get much better jobs than SMK graduates like me" (informant 5, interview, March 9, 2025). This statement reflects students' motivation to continue to higher education with hopes of improving better quality of life through better employment.

Internal factors also influencing students' interest in continuing higher education include academic achievement. Based on interview results, academic achievement becomes a factor influencing interest in continuing higher education. As stated by informant 2, who mentioned participating in economics olympiad competitions and achieving awards that might serve as provisions for pursuing higher education: "My grades are quite good, so I'm confident I can follow lectures well. I once participated in online economics olympiads, achieving 2nd place nationally. Maybe the certificate can add plus points for continuing college" (informant 2, interview, February 28, 2025). Observation results also show students with good academic achievement tend to have interest in continuing to higher education. This demonstrates the diversity of students' academic backgrounds influences their perceptions of achievement importance for higher education.

External factors also influence students' interest in continuing to higher education, including social environment support. Social environments around students influence their development, behavior, and social interactions. Social environments are divided into three main elements: family, school, and community. Family environments significantly influence students, as stated by informant 2, that interest in continuing to higher education is influenced by parental support and family member role models who have successfully pursued higher education. "Parents provide full support both financially and motivationally for me to continue college. Family members who went to college exist, my sibling graduated from STAN. So I'm motivated to continue education" (informant 2, interview, February 28, 2025). This statement illustrates that family members also function as role models for students interested in continuing to higher education while sharing experiences they gained.

Based on field observations at SMK Batik 2 Surakarta, the school has also created programs as facilities for students to broaden perspectives regarding various pathway options available after SMK graduation, especially for students still considering between working directly or continuing to higher education. During Edu Fair and Job Fair activities, all students appeared enthusiastic in seeking both job opportunities and planning for higher education. This was evident from students' active participation in seeking information from various institutions.

Meanwhile, community environments, based on interview results, can be assumed to have quite diverse influences on SMK students' interest in continuing to higher education. Community awareness of education can be motivating, but students personally still maintain control over interest in continuing to higher education. This indicates that combinations of external support and personal motivation play important roles in influencing student interest.

In this research, despite having growth in perceptions of the importance of continuing to higher education, several significant obstacles affect students in decision-making for continuing education were found. Two main obstacles hindering students in continuing to higher education are family financial constraints and low self-efficacy in academic challenges. Nevertheless, most students seek alternatives by making efforts to overcome obstacles in continuing higher education. This demonstrates students' strong interest in achieving their desires to continue to higher education.

Overall, research results show that students at SMK Batik 2 Surakarta basically understand the importance of continuing to higher education to achieve better opportunities in the future. Interest in continuing to higher education is greatly influenced by various personal conditions of each student, both internal and external factors that become main considerations in determining education continuation decisions. Internal factors such as personal motivation and academic achievement, plus external support in the form of active social environment roles, especially schools and alignment between vocational programs and higher education majors, contribute to growing awareness of perceptions about the importance of continuing education after SMK graduation. Combinations of internal and external factors can become consideration materials for determining decisions to continue to higher education.

**Discussion**

**Factors Influencing SMK Students' Interest in Continuing to Higher Education**
Factors influencing SMK students' interest in continuing to higher education are caused by two factor categories: internal and external factors.

**Internal Factors**
Internal factors originate from individuals consisting of two aspects: personal motivation and academic achievement. Personal motivation becomes one of the internal factors playing important roles in influencing SMK students' interest in continuing to higher education. According to Munira (2017), motivation is a process determining the extent of human activity levels, intensity, consistency, and action direction. In continuing to higher education, self-motivation is needed to trigger enthusiasm for achieving goals. Without strong personal motivation, students tend to lose motivation and give up easily.

Research results show that self-motivation becomes the main foundation for students in influencing interest in continuing to higher education. Students have motivation to continue to higher education not only based on academic needs but also encompassing emotional and social aspects. Personal motivation that emerges includes desires to achieve higher aspirations by expanding knowledge and obtaining academic degrees as future provisions. Additionally, student motivation also originates from hopes of improving living standards through better employment. Students have awareness that higher education degrees can open promising career opportunities. Through higher education, students also have desires to make parents proud and fulfill family expectations.

Internal factors also significantly influencing students' interest in continuing higher education include academic achievement. Achievement becomes an indicator of student success during learning processes that can influence interest in continuing higher education. Academic achievement can take academic and non-academic forms. Therefore, academic achievement encompasses not only cognitive elements but also human skills and attitudes influenced by oneself and others. This also becomes an indicator of student readiness in facing challenges at higher education levels.

Nevertheless, some students consider academic achievement not the only main factor influencing interest in continuing to higher education. This is because students feel desires and personal motivation in achieving aspirations for pursuing higher education are greater than relying on academic achievement. On the other hand, suboptimal academic achievement can become references for students to work harder in studying to compete in higher education entrance selections.

**External Factors**
External factors are influenced by environments around individuals, including social environment. Social environments influencing students in continuing to higher education, according to research by Janah et al. (2018), are divided into three main components: family, school, and community environments.

Families serve as environments where individuals grow and develop. Family environments, especially parents, play important roles in student decision-making for continuing to higher education. Support provided by families through motivation, advice, and care can influence students to have interest in continuing higher education. Meanwhile, economic support includes basic needs and supporting facilities during education. Supportive family environments instill long-term educational values, shaping student mindsets so they view education as future investment rather than merely academic obligations. Therefore, strong support from family environments becomes motivation for students in determining their futures, including having interest in continuing to higher education.

Schools become second social environments for students after family environments as formal educational institutions aimed at providing guidance, learning, and training for character development and student knowledge. Field conditions show SMK Batik 2 Surakarta provides adequate contributions to increasing students' interest in continuing to higher education, although school roles are still considered less effective in encouraging SMK students' interest in continuing to higher education. This is because SMK's primary orientation directs students to be ready for

workforce entry. Nevertheless, it is important for schools to continue providing opportunities for students interested in continuing to higher education. Forms of support already provided by schools include providing information regarding higher education selections and scholarships, distributing brochures or socialization from higher institutions, organizing Edu and Job Fairs, and teacher mentoring.

Communities also have significant influences supporting students to continue to higher education. Community environments consisting of relatives, neighbors, playmates, and social communities play important roles in forming and directing each child's personal development. Setiawan (2018) explains that community environments play important roles in children's personal development, influencing thinking patterns, behavior, and relationships with others. Research results show several students feel positive encouragement to continue to higher education. This reflects community expectations believing that education is one of the main paths to success. Communities serve as external environments providing hopes and recognition that younger generations are not sufficient with only secondary education.

Alignment between vocational programs chosen by students in SMK and major choices in higher institutions represents one of the key factors influencing interest in continuing higher education. Students who feel that majors of interest in higher institutions are relevant to educational backgrounds they studied in SMK tend to be more motivated to continue higher education. This relates to confidence from previous learning experiences influencing interest in continuing higher education.

Students express that interest in continuing to higher education by choosing majors relevant to SMK vocational programs is driven by desires to develop knowledge in fields they have previously studied. This emphasizes connections between SMK vocational program alignment and higher education majors as advanced stages in competency development acquired during SMK.

**Obstacles and Efforts Students Face in Continuing to Higher Education**

In this research, several significant obstacles affecting students in decision-making for continuing to higher education were found. Two main obstacles hindering students in continuing to higher education include family financial constraints and low self-efficacy in academic challenges.

Family financial constraints become primary obstacles often experienced by students. Financial constraints make college costs one of the biggest considerations in determining decisions to continue education. Research results show that students at SMK Batik 2 Surakarta come from lower-middle-class families, so not all students can realize these desires. This aligns with research by Alexandro et al. (2021) stating that low student interest in continuing higher education is caused by financial constraints. Based on student statements, financial constraints exist because other family members still need educational costs. This causes several students to feel doubtful and worried that costs for continuing higher education will burden parents. Awareness of family financial responsibility can cause some students to postpone or abandon desires to continue education.

Some students whose families have concerns about educational costs choose to take initiatives or seek solutions through scholarships and part-time work. However, lack of scholarship information often hinders student development. This shows the need for stronger information and mentoring to help students have open and well-considered choices. Family financial constraints encourage students to seek various alternatives to continue to higher education. The most considered alternative to overcome family financial constraints for students is working. Several students plan to work part-time while attending college, while others plan to work full-time until financial conditions are stable enough to continue education.

Facing low self-efficacy in academic challenges, most SMK students in continuing higher education often encounter personal obstacles. One frequently experienced challenge is curriculum differences between SMK and SMA, especially in subjects that become subtests in higher education entrance examinations. This is based on SMK emphasizing readiness for workforce entry, making learning more dominant in practice than theory. These conditions create feelings of lack of confidence or low self-efficacy regarding their academic abilities. This situation also aligns with research by Lase (2020) stating that low student self-efficacy influences low interest in continuing education to higher levels.

Through these challenges, students make various efforts to adapt and prepare academically. Some use various learning materials and take initiatives for independent study. Additionally, some students utilize social media platforms to obtain information about higher institutions and join learning communities to expand their knowledge.

## Conclusion

From research results and discussion, there is interest development and growing perception changes among SMK Batik 2 Surakarta students. Beginning from direct work orientation, they have become aware of higher education's importance as future investment. It can be concluded that SMK students' interest in continuing to higher education is influenced by various factors, both from within students (internal) and from surrounding environments (external). Internal factors emerge naturally within students' personalities, such as desires to deepen skills, obtain degrees, and expand relationships and broader knowledge. Additionally, student academic achievement results during school can also influence student decisions depending on how good these results are. Meanwhile, external factors receive influences from outside individuals, including social environments from families, schools, and communities as closest interaction places for students. Meanwhile, alignment between SMK vocational programs and study program choices in higher education also becomes one factor related to students, thus influencing interest in continuing to higher education. Combinations of both factor categories are interconnected and mutually influential; supportive external factors will not be effective if individuals do not have strong motivation or desires from students' personalities. Therefore, balance between internal and external factors becomes a key element in growing and maintaining individual interest in continuing to higher education. By knowing the most influential factors, schools can implement socialization programs, mentoring, and higher institution visits as concrete strategies for building student knowledge as early as possible. Research results can also become references for students in future planning more wisely and realistically according to their interests and abilities. Students are expected to be proactive in various activities for self-development supporting their competencies and expertise, both academic and non-academic. It is also hoped that parents instill positive mindsets to support children's educational continuity, not only considering financial aspects but also as long-term investments for children's futures. Additionally, this research can become references for future researchers to examine broadly factors influencing SMK students' interest in continuing to higher education.

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# Implementation of construction procurement through tender method at BPBJ Surakarta

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***Abstrak***

*Pengadaan pekerjaan konstruksi melalui metode tender di lingkungan pemerintah daerah memiliki peran penting dalam menjamin keterbukaan, akuntabilitas, dan efisiensi pelaksanaan proyek publik. Penelitian ini mengkaji implementasi pengadaan pekerjaan konstruksi melalui metode tender yang dilaksanakan oleh Bagian Pengadaan Barang dan Jasa (BPBJ) Kota Surakarta. Fokus kajian terletak pada tahapan yang ditangani oleh BPBJ, mulai dari penerimaan dan verifikasi dokumen permohonan dari pengguna anggaran hingga penyusunan dan penandatanganan hasil akhir proses tender. Metode penelitian yang digunakan adalah deskriptif kualitatif, dengan teknik pengumpulan data melalui observasi, wawancara, dan dokumentasi. Hasil penelitian menunjukkan bahwa pelaksanaan tender di BPBJ dilakukan secara elektronik melalui Sistem Pengadaan Secara Elektronik (SPSE), dengan alur kerja yang mencakup verifikasi kelengkapan berkas, penetapan pokja, penyusunan dan pengunggahan dokumen tender, hingga pemberitahuan hasil seleksi. Beberapa kendala yang ditemukan antara lain dokumen permohonan yang belum lengkap, kesalahan teknis dalam penyusunan dokumen pemilihan, serta adanya sanggahan dari peserta yang memperlambat proses. Oleh karena itu, diperlukan peningkatan ketelitian dalam verifikasi awal, perbaikan kualitas dokumen, serta penguatan koordinasi antar pihak terkait. Temuan ini diharapkan dapat menjadi masukan untuk penguatan tata kelola pengadaan pekerjaan konstruksi melalui metode tender di BPBJ Kota Surakarta.*

*Kata kunci: penyedia; pokja; seleksi; tahapan pemilihan; tata kelola*

**Abstract**

Construction work procurement through tender methods in local government environments plays a critical role in ensuring transparency, accountability, and efficiency in public project implementation. This study examined the implementation of construction procurement through tender methods conducted by the Procurement of Goods and Services Division (BPBJ) of Surakarta City. The research focused on stages managed by BPBJ, from receipt and verification of application documents

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through preparation and issuance of final tender results. We employed a qualitative descriptive approach, collecting data through observation, interviews, and documentation analysis. Findings revealed that BPBJ conducts tender processes electronically via the Electronic Procurement System (SPSE), following workflows that include document verification, working group assignment, tender document preparation and upload, and selection outcome notification. Identified challenges included incomplete application files, technical errors in document preparation, and participant objections that delayed processes. We recommend improved document verification accuracy, enhanced quality control, and strengthened inter-party coordination. These findings contribute to strengthening governance in construction procurement through tender methods at BPBJ Surakarta.

## Introduction

Information technology development has transformed governance systems significantly, promoting digitalization to improve public service efficiency and transparency (Yulianti et al., 2021). Digitalization facilitates data storage and access while strengthening accountable and open public administration. E-government represents one concrete manifestation of public sector digitalization, utilizing information technology to implement government functions effectively and efficiently (Pertiwi et al., 2021). Government procurement has become a key area undergoing digital transformation, as regulated in Presidential Regulation No. 12 of 2021 on Government Procurement of Goods and Services.

Construction works constitute a strategic procurement type due to their direct relevance to infrastructure development. Law No. 2 of 2017 defines construction works as activities including construction, maintenance, demolition, and renovation of buildings or other infrastructure. The tender method serves as the primary mechanism for selecting construction service providers, ensuring transparency, fair competition, and accountability (Andriana, 2021). The government subsequently developed an electronic procurement system through the Electronic Procurement Service (LPSE), where the Electronic Procurement System (SPSE) enables complete digital tender processes, from announcements through evaluation and awarding (Nanda et al., 2023).

Despite SPSE system implementation, construction procurement through tender methods still faces challenges in administrative technicalities and stakeholder coordination. Data from LPSE Surakarta City shows fluctuating numbers of procurement packages through tender methods annually. Table 1 presents this information:

**Table 1**
*Number of Procurement Packages by Tender Method in the Surakarta City Government (2022–2024)*

| No | Type of Procurement | 2022 | 2023 | 2024 |
|----|---------------------|------|------|------|
| 1 | Goods Procurement | 24 | 6 | 3 |
| 2 | Construction Work Services | 90 | 96 | 63 |
| 3 | Consultancy Services | 39 | 24 | 6 |
| 4 | Other Services | 44 | 4 | 2 |

Source: Data processed from https://lpse.surakarta.go.id/

The table shows decreased procurement packages in several categories, including goods procurement, consultancy services, and other services, due to increased e-catalog system usage replacing tender methods for certain procurement types. However, construction works remain dominant with the highest package numbers, indicating their strategic importance for regional development. Previous studies primarily focused on general e-procurement effectiveness, while specific studies on construction procurement implementation by tender at regional levels, particularly in Surakarta City Government, remain limited. Therefore, a research gap exists, necessitating contextual analysis of construction work procurement implementation through tender methods at local levels.

Implementation in public policy constitutes a crucial process for realizing decisions by utilizing resources and infrastructure within defined timeframes. According to Yuliah (2020), implementation involves executing and managing policies to ensure outcomes align with policy goals. Rosad (2019) adds that implementation extends beyond administrative routine, requiring planned, serious, and measurable activities. Edward III's implementation theory in Winarno (2002) explains seven key factors for successful policy implementation: clarity of policy standards and objectives, resource availability, communication effectiveness, implementing agency characteristics, social and political environment, implementers' dispositions, and commitment intensity. These seven factors interact to shape public policy implementation effectiveness, including government procurement.

Government procurement forms an integral part of good governance, aiming to obtain goods and services at reasonable prices with appropriate quality and timely delivery (Arifin, 2018). Procurement extends beyond government institutions to state-owned enterprises and private sectors (Faisal et al., 2017). Presidential Regulation No. 12 of 2021 outlines procurement as encompassing all activities from need identification through work result handover. Four procurement types exist: goods procurement, construction works, consultancy services, and other services. Procurement substantially impacts national economic growth. According to Azwar (2016), procurement realization contributes positively to long-term economic development. Construction works play pivotal roles, involving infrastructure development that forms regional progress foundations. Suliantoro et al. (2020) emphasize that construction serves as national development backbone, enhancing interregional connectivity, improving public service access, and creating sustainable economic growth bases. Nursetyo (2015) notes that national development requires robust and competitive construction services sectors to improve project execution efficiency.

Regulation of the National Public Procurement Agency (LKPP) No. 11 of 2021 stipulates that construction procurement consists of general and specialist construction works. General construction works include building and civil structure construction, covering construction, maintenance, demolition, and reconstruction activities. Specialist construction works include installations, special construction, prefabricated structures, finishing works, and equipment rental. Tender methods select providers of goods, construction works, or other services that cannot be procured through alternative means such as e-purchasing or direct appointment. Regulation No. 12 of 2021 states that tenders may be conducted through prequalification or postqualification, each with implications for time and accuracy in provider selection. Therefore, investigating construction procurement implementation through tender methods at Surakarta City Procurement Services Unit (BPBJ) offers relevant and data-driven policy recommendations.

## Methodology

This research was conducted at the Procurement of Goods and Services Section (BPBJ) of Surakarta City, located in the City Hall Complex, Jalan Jendral Sudirman No. 2, Kampung Baru, Pasar Kliwon District, Surakarta City. We selected this location due to BPBJ's official authority in managing goods and services procurement and implementing procurement policies at regional levels, particularly within the Electronic Procurement Service (LPSE) Division, which oversees electronic tender processes for construction works.

We employed a qualitative approach with case study design to comprehensively analyze construction procurement implementation through tender methods at BPBJ Surakarta. The qualitative approach was chosen to gain in-depth understanding of contexts, processes, and natural

conditions related to procurement activities at BPBJ Surakarta (Fadli, 2021). Case study design was appropriate because this research focused on in-depth investigation of procurement practices within a specific institution, namely BPBJ Surakarta. This design systematically explored and described processes, mechanisms, and challenges involved in construction service procurement implementation through tender methods, providing comprehensive and contextualized overviews of procurement practices (Malahati et al., 2023).

The study population included all construction service procurement activities managed by BPBJ Surakarta from 2022 to 2024. We determined the sample using purposive sampling, deliberately selecting informants based on specific criteria (Sumargo, 2020). Criteria included active involvement in at least two construction service procurement projects during the research period to ensure informants possessed sufficient experience and deep understanding of procurement processes. Additional criteria included holding significant strategic or operational roles, such as Head of LPSE Division, Head of Procurement Section, or Procurement Working Group (Pokja) members, because individuals in these positions directly responsible for decision-making and procurement process implementation. We also required willingness and availability to participate in interviews for effective data collection, while access to and familiarity with relevant procurement documents and procedures were essential for obtaining accurate and comprehensive information supporting research finding validity.

Data collection techniques included observation, interviews, and documentation. Observation, derived from "to observe" meaning closely watching phenomena (Khasanah, 2020), was conducted directly and non-participatively at BPBJ Surakarta office. Observation specifically focused on provider selection processes by monitoring tender implementation from announcement stages through completion within BPBJ. We conducted this using observation checklists including tender process stages, document verification, decision-making, and SPSE system usage. We carried out structured interviews with five key informants, consisting of the Head of LPSE Division, Head of Procurement Section, and three Procurement Working Group (Pokja) members. Interviews were conducted between January and February 2025 using consistent sets of open-ended questions (Fadhallah, 2021) to explore detailed insights into provider selection processes, encountered obstacles, procedural compliance, and procurement regulation application. Documentation, as a continuous process of transforming tacit knowledge into explicit understanding (Sudarsono, 2017), involved collecting relevant materials such as Standard Operating Procedures (SOP) for procurement and detailed tender process documentation handled by BPBJ Surakarta. This documentation complemented data obtained from observations and interviews, enhancing validity and reliability through triangulation.

We employed the Miles and Huberman model for data analysis, consisting of three stages: data reduction, data display, and conclusion drawing/verification (Saleh, 2017). Data reduction focused on selecting and summarizing relevant data from interviews and documentation, indicating high volumes of construction tender packages. Data display was arranged descriptively to show construction service procurement dominance through tender methods at BPBJ Surakarta. We drew conclusions based on emerging patterns, with data validity ensured through source and technique triangulation across observations, interviews, and documentation. The decision to use the Miles and Huberman model instead of alternatives like grounded theory or thematic analysis was based on its suitability for qualitative research involving ongoing data interaction. This model proves particularly effective for public sector studies, providing structured yet flexible frameworks to trace decision-making processes and uncover complex patterns in procurement implementation.

To ensure finding validity and credibility, we applied triangulation of sources and techniques by comparing results from observations, interviews, and documentation. This method enhanced research reliability by ensuring consistency across various data collection methods.

## Results and Discussion

### Implementation of Construction Work Procurement through Tender Method at the Procurement of Goods and Services Section of Surakarta City

The Procurement of Goods and Services Section (BPBJ) of the Regional Secretariat of Surakarta City plays a strategic role in ensuring government procurement of goods and services follows transparency, accountability, and efficiency principles. In construction work procurement contexts, tender methods constitute selection methods that guarantee fair competition and equal opportunities for all construction service providers. This aligns with principles stated by Denny Indra Lesmana et al. (2025) that goods and services procurement, particularly in construction, plays crucial roles in government development and public service enhancement, with electronic procurement platforms like LPSE ensuring transparency, accountability, and fair competition.

BPBJ Surakarta implements tender methods through systematic stages, starting from procurement planning, preparation, selection preparation, selection execution, contract implementation, and work result handover. The aim involves creating best value for money and ensuring construction work result quality. This statement reinforces findings by Dhall (2020), who found that applying tender methods in public construction procurement reduces collusion risks and increases participation from qualified providers. Tender design serves as a potential tool to address competition concerns and mitigate procurement market threats. According to a BPBJ resource person, this method ensures open and competitive processes: "The tender method is used so that procurement processes can be conducted transparently, with nothing hidden. All qualified construction service providers can participate, allowing government to select providers with the best offers and appropriate quality" (Technical Policy Reviewer of Goods and Services Procurement, personal communication, January 28, 2025).

Construction work complexity, involving architectural, structural, and electrical aspects, requires procurement implementation according to technical standards and procedures. This finding aligns with Mwelu et al. (2020), who argue that construction procurement success heavily depends on strict procedural compliance due to involved technical complexity. Studies show that procurement regulatory framework compliance significantly mediates relationships between various factors and project success in public road construction. Irregularities in any stage can have serious consequences for project success. A BPBJ staff member stated: "If one stage is missed or does not comply with procedures, it can affect the entire project, especially for construction work with large value and complexity" (BPBJ Staff, personal communication, January 20, 2025).

Field observations and in-depth interviews showed that BPBJ Surakarta consistently refers to Standard Operating Procedures (SOP) in every construction work tender implementation stage. These SOPs serve as technical guidelines ensuring each process complies with regulations and supports field consistency. This aligns with Rahmawati and Suryana (2024) study, which highlights that Standard Operating Procedures (SOPs) play crucial roles in enhancing efficiency, consistency, and compliance in procurement processes across various industries. SOPs help minimize errors, improve productivity, and ensure adherence to regulations and standards. To provide clearer workflow pictures, Figure 1 illustrates the construction work procurement process through tender methods at BPBJ Surakarta.

**Figure 1**
*Flowchart Construction Work Procurement through Tender Method at BPBJ Surakarta City*



Source : BPBJ Manual Book – General Public (2025)

The following explains stages related to construction work procurement through tender methods at the Procurement of Goods and Services Section of Surakarta City: (1) The procurement process begins when the Commitment Making Officer (PPK) submits tender request documents to the BPBJ Front Office. Front Office staff then verify document completeness using checklists based on applicable SOPs. If deficiencies exist, documents are returned for completion before proceeding to next stages. (2) Once Front Office deems documents complete, the Procurement Team Leader drafts Decision Letters (SK) for Working Groups (Pokja), appointing members and assigning responsibilities for tender processes. (3) Appointed Pokja members sign official appointment minutes as forms of agreement and willingness to carry out duties according to applicable regulations. (4) Signed SKs are then approved by the Head of Procurement Section, serving as legal bases for Pokja to officially commence duties. (5) After SK approval, all procurement documents and supporting files are officially handed over to Pokja, marking provider selection process starts. (6) Pokja begins tender preparation, such as planning execution strategies, assigning tasks, and preparing systems and supporting facilities to ensure smooth provider selection. Next, Pokja

thoroughly reviews procurement documents, including technical specifications, owner's estimates (HPS), contract drafts, budget conformity, RUP package identification, and market analysis to ensure all technical and administrative aspects comply with regulations. (7) After confirming document validity and completeness, Pokja prepares and finalizes selection working papers as tender process guidelines. These working papers include procedures, stages, and evaluation criteria to ensure transparency and accountability. (8) Selection documents are completed with participant requirements, technical specifications, evaluation criteria, and tender procedures, then approved by authorized officials as binding official guidelines. (9) After preparation, Pokja uploads documents into the Electronic Procurement Service System (SPSE), enforcing strict administrative and technical requirements such as Business Entity Certificates (SBU), Work Expertise Certificates (SKK), similar project experience, and Expertise (SKA) or Skills Certificates (SKT). All construction work procurement via tender is conducted electronically and integrated within SPSE, as shown in Table 2.

**Table 2**
*Stages of Construction Work Procurement via Tender in the SPSE System*

| Stage | Time Description |
|---|---|
| Post-qualification Announcement | At least 5 (five) calendar days |
| Download of Selection Documents | From the first day of tender announcement until the deadline for submission of offers |
| Clarification Session | At the earliest 3 (three) calendar days after tender announcement, during working days and hours |
| Uploading of Bid Documents | At least 3 (three) calendar days after clarification, ending during working days and hours |
| Bid Opening | After the bid submission deadline |
| Administrative, Qualification, Technical, and Price Evaluation | As needed |
| Qualification Verification | As needed |
| Winner Determination | At most 1 (one) calendar day after qualification verification |
| Winner Announcement | At most 1 (one) calendar day after winner determination |
| Objection Period | 5 (five) calendar days after winner announcement; responses within a maximum of 3 (three) working days |
| Appointment Letter of Provider | As needed |
| Contract Signing | As needed |

After completing all provider selection stages, including document evaluation, clarification, technical or price negotiation (if needed), and winner determination and announcement via SPSE, Pokja prepares notification reports indicating that selection processes are complete as official documentation. The Procurement Team Leader reviews notification letters and completion reports from Pokja to ensure data accuracy and document validity, then initials letters and forwards them to the Head of Procurement Section. The Head of Procurement Section signs notification letters of selected providers as official tender result documents. After signing, Front Office assigns letter numbers, delivers selection results, and archives documents. Thus, all provider selection stages are considered complete, and contracts between PPK and providers can commence according to applicable regulations.

**Obstacles in Construction Work Procurement through the Tender Method**

Based on interviews and observations, several common issues arise during construction tender processes:

**Failed Tender**

Tenders are declared failed if no participants pass administrative, technical, and/or price evaluations. This may occur due to poor-quality bids, errors in document completion, or lack of understanding of tender documents. This finding aligns with research conducted by Adistana et al. (2022), who found that tender failures in government procurement are often caused by providers' lack of understanding of technical and administrative requirements. Common factors include inability to attach references to previous projects. Similarly, Arifin et al. (2020) reported that insufficient knowledge of changing regulations and administrative errors in completing auctions can cause tender failures.

**Tender Cancellation**

Tenders can be canceled due to policy changes or altered needs from user government agencies (OPD), such as budget revisions or program priority changes. In such cases, Pokja must stop ongoing tender processes to restructure procurement according to updated needs. As stated by a BPBJ Selection Pokja member: "We once canceled a tender due to a budget revision. The OPD requested complete changes in specifications and work volume, so we had no choice but to cancel and plan procurement again" (BPBJ Selection Pokja, personal communication, February 3, 2024). This finding is supported by Casady et al. (2023), who argue that dynamic changes in government budget allocations and program priorities can significantly impact ongoing procurement processes, leading to tender cancellations.

**Human Resource Capacity**

Several constraints relate to human resource capacity, both from providers and OPD users. Some providers lack sufficient technical understanding of tender requirements, resulting in document disqualification at evaluation stages. Conversely, OPD users sometimes do not optimally prepare selection documents, triggering needs to revise selection documents. This issue aligns with findings by Yevu et al. (2022), who identified that effective procurement requires specific skills to overcome capacity limitations. Limited HR competence, particularly in understanding e-procurement systems and technical document preparation, has been identified as critical barriers to procurement effectiveness.

## Conclusion

The implementation of construction procurement through tender methods at the Procurement of Goods and Services Section of Surakarta City follows Presidential Regulation No. 12 of 2021 and Institution Regulation No. 12 of 2021, conducted electronically via the LPSE system integrated with SiRUP to ensure transparency, effectiveness, and accountability. Despite regulatory compliance, challenges such as failed and canceled tenders arise due to factors including lack of qualified participants, urgent requirement changes, budget revisions, and unrealistic cost estimates. Limited human resource capacity from both providers and user agencies also hinders processes. To address these issues, regular technical training and procurement document guidance are necessary. BPBJ should conduct periodic tender evaluations to improve procedures, while OPDs must ensure accurate and complete documents to avoid delays. This study is limited to tender processes without examining economic impacts of construction procurement on regional development. Future research should explore construction outcomes' effectiveness in enhancing public services and economic growth, as well as develop comprehensive procurement performance evaluations to improve local government efficiency.

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# Role of entrepreneurship education in developing students' entrepreneurial mindset

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### *Abstrak*

*Penelitian ini bertujuan untuk mengetahui peran pendidikan membangun mindset berwirausaha siswa kelas XII Manajemen Perkantoran SMK Negeri 6 Surakarta. Penelitian kuantitatif korelasional dengan populasi siswa kelas XII Manajemen Perkantoran SMK Negeri 6 Surakarta tahuni pelajaran 2023/2024 dengan jumlah sampel 85 responden. Penelitian ini diambil menggunakan teknik cluster random sampling. Metode pengumpulan data menggunakan kuesioner atau angket. Teknik analisis data menggunakan teknik analisis regresi linier berganda dengan bantuan program kerja IBM SPSS 25. Dari hasil penelitian dapat disimpulkan bahwa terdapat pengaruh positif dan signifikan pendidikan kewirausahaan terhadap mindset berwirausaha (nilai $t_{hitung}$ 10,453 >$t_{tabel}$ 1,98932), Kontribusi pendidikan kewirausahaan sebesar 56.8%, sedangkan 43,2% dipengaruhi oleh faktor lain yang tidak termasuk dalam penelitian.*

*Kata kunci: kewirausahaan; mindset; pendidikan*

### Abstract

This study aims to investigate the role of entrepreneurship education in developing entrepreneurial mindset among Grade XII Office Management students at SMK Negeri 6 Surakarta. This correlational quantitative research involved a population of Grade XII Office Management students at SMK Negeri 6 Surakarta for the 2023/2024 academic year, with a sample of 85 respondents selected using cluster random sampling technique. Data collection employed questionnaire methods, and data analysis utilized multiple linear regression techniques with IBM SPSS 25. Results demonstrate a positive and significant effect of entrepreneurship education on entrepreneurial mindset (t-calculated $10.453 >$ t-table $1.98932$, $p < 0.001$). The contribution of entrepreneurship education accounts for 56.8% of variance in entrepreneurial mindset, while 43.2% is influenced by other factors not included in this study. These findings suggest that well-structured entrepreneurship education programs can effectively foster entrepreneurial thinking patterns among vocational students, contributing to the development of future entrepreneurs who can create employment opportunities and reduce unemployment rates.

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## Introduction

Unemployment represents a critical component of national economic health. Declining economic growth rates contribute to increased unemployment levels, which escalate when the labor force cannot be adequately absorbed into the job market. Educational attainment significantly influences unemployment rates. Supriyanto (2016) argues that obtaining employment requires education and skills from job seekers competing in labor markets capable of absorbing workers. However, when examined from educational perspective, open unemployment rates remain dominated by Vocational High School (SMK) graduates. This occurs due to human resources exceeding available job opportunities, while the mindset for creating employment opportunities remains remarkably low among educated populations.

According to Yanti et al. (2014), addressing unemployment challenges requires fostering entrepreneurial development. This necessitates forming human resources with entrepreneurial spirit and mindset. Generally, society perceives entrepreneurship as inherited traits requiring financial freedom, risk-taking abilities, and substantial capital for success. These prevalent societal mindsets require redirection toward more positive frameworks, encouraging broader entrepreneurial participation that creates employment opportunities for others, thereby reducing existing unemployment problems. Therefore, mindset formation requires individual awareness development through systematic strategies.

Entrepreneurial mindset represents thinking patterns possessed by entrepreneurs characterized by innovative and creative thinking accompanied by intelligent opportunity recognition. Beginning with desires manifested in business actions practiced in the field, naturally involving innovative breakthroughs that generate profits (Lewenussa & Suaidy, 2019). Entrepreneurial mindset formation can be influenced by internal and external factors, starting from internal entrepreneurship education factors and external factors representing activities related to entrepreneurship.

According to Carol Dweck (as cited in Rosmiati et al., 2022), mindset is categorized into two types: fixed mindset and growth mindset. Fixed mindset represents views that individual abilities cannot change, with characteristics determined from the beginning. Fixed mindset characteristics include lack of confidence, giving up when facing problems, excessive comfort zone preference avoiding challenges, rejection of criticism and suggestions from others, and feeling threatened by others' success. Conversely, growth mindset represents views that abilities can be developed through effort and habits, generally enabling modification or development of personal characteristics with full conviction. Growth mindset characteristics include confidence, perseverance in facing problems, courage to accept opportunities and challenges, willingness to receive criticism and suggestions from others, and using others' success as motivational learning.

Entrepreneurial mindset represents entrepreneurial-oriented thinking frameworks, preferring to navigate uncertainty rather than avoiding it, viewing situations more simply than others, and willingness to make risky decisions.

Entrepreneurship education plays crucial roles in forming entrepreneurial mindset or entrepreneurial thinking patterns. According to Tessema (2012), entrepreneurship education represents learning processes conducted to acquire knowledge about entrepreneurship. Meanwhile, Iyortsuun (2020) defines entrepreneurship education as knowledge, skills, and attitudes impacting entrepreneurial character and behavior. Entrepreneurship education provides theoretical foundations for business concepts and behaviors (Wardana et al., 2020). Entrepreneurship education not only provides knowledge and skills regarding entrepreneurial concepts but forms attitudes, behaviors,

and thinking patterns (mindset) of entrepreneurs. According to Ahmed et al. (2020), entrepreneurship education represents one driver helping human resources learn more about starting businesses or entrepreneurship, while enhancing individual skills when starting businesses and building business management skills, creating human resources capable of becoming better entrepreneurs. Entrepreneurship education aims to develop human resources capable of creating employment opportunities for others.

Indonesia has several school categories including madrasah aliyah, senior high schools, and schools specialized in specific fields preparing graduates for immediate employment, commonly called vocational high schools. The expectation is that after graduation, students obtain employment with skills provided in subjects, particularly entrepreneurship, to realize jobs that can open new employment opportunities for job seekers, hopefully reducing high unemployment in Indonesia.

Among several vocational high schools in Surakarta, SMK Negeri 6 Surakarta represents a school with several specialized programs including Accounting, Office Management, Marketing, Travel Business, Multimedia, Broadcasting, and Software Engineering. SMK Negeri 6 Surakarta has long been recognized as an entrepreneurship-based school with school activities supporting students in running businesses. This research aims to determine the role of entrepreneurship education in building mindset among Grade XII Office Management students at SMK Negeri 6 Surakarta.

## Research Methods

This research was conducted at SMK Negeri 6 Surakarta, located at Jl. Adi Sucipto No. 38, Kerten, Laweyan District, Surakarta City, Central Java. The research period spanned 5 months from September to December 2024, from proposal preparation to thesis report completion. Research permits were approved by the principal of SMK Negeri 6 Surakarta and the Regional Education Office Branch VII.

This research employed quantitative methods with correlational approaches, as this approach can determine the role of entrepreneurship education in building student mindset. The population used in this research consisted of Grade XII students at SMK Negeri 6 Surakarta, totaling 107 students, while the sample comprised 85 students obtained through Slovin formula calculations, as detailed in Table 1.

**Table 1**
*Sample Selection*

| Class/Major | Population | Sample Calculation | Sample Size |
|---|---|---|---|
| XII Office Management 1 | 35 | $\frac{35}{107} \times 85$ | 27 |
| XII Office Management 2 | 36 | $\frac{36}{107} \times 85$ | 29 |
| XII Office Management 3 | 36 | $\frac{36}{107} \times 85$ | 29 |
| Jumlah | | | 85 |

Source: Data processed by researcher (2024)

The sample selection process detailed in Table 1 demonstrates proportional representation across all Grade XII Office Management classes, ensuring balanced participation from each class while maintaining statistical validity for the research findings.

Research instruments utilized questionnaires with cluster random sampling techniques for sample selection, while data collection employed direct face-to-face methods with respondents and internet-based methods using electronic devices with Grade XII Office Management students through Google Forms containing 6 statement items. Likert scales used in this research employed 1-4 interval scoring: strongly agree, agree, disagree, and strongly disagree. Variables measured were broken down into variable indicators subsequently used as benchmarks for measuring instrument

items in statement form. According to Sugiyono (2022), Likert scales are used to reference individual attitudes and perceptions regarding social phenomena. Using Likert scales, each variable can be measured through assessment indicators and subsequently used as items in data compilation.

Instrument validation techniques employed validity and reliability tests using Karl Pearson product moment correlation formulas and Cronbach's Alpha. Normality tests in this research used One-Sample Kolmogorov-Smirnov methods. Data analysis employed t-tests, F-tests, determination coefficient analysis, effective and relative contributions, and multiple linear regression. All data processing and analysis stages were conducted using IBM SPSS 25.

According to Falah and Marlena (2022), three indicators are used to assess entrepreneurship education: (1) Educational programs fostering entrepreneurial interest, meaning students have undertaken entrepreneurship learning in schools to encourage participation in business activities through entrepreneurship practice and business programs, increasing students' willingness to become entrepreneurs; (2) Entrepreneurial knowledge and insights, where students who have pursued entrepreneurship education learn everything about entrepreneurship, including entrepreneurial activities, entrepreneurship benefits, and challenges faced when conducting entrepreneurial activities, resulting in students becoming very interested and wanting to become entrepreneurs; and (3) Awareness of business opportunities, where students can see entrepreneurial opportunities and become aware of entrepreneurship importance.

## Results and Discussion

### Research Results

Normality tests were conducted to determine whether independent and dependent variables are normally distributed in regression equations. Normality tests used in this research employed one-sample Kolmogorov-Smirnov tests processed using SPSS version 25 with 5% error rates. Data normality can be determined by examining significance values. If significance values > 0.05, data are declared normally distributed.

**Table 2**
*Normality Test Results*

| Asymp. Sig. (2-tailed) | ,200[c,d] |
|---|---|

Source: Primary data processed by researcher (2024)

Table 2 shows normality test results with significance values of 0.200 > 0.05, indicating that collected data are normally distributed. Linearity tests aim to determine relationships between independent variables (X) and dependent variables (Y). This research employed Test for Linearity with SPSS 25 assistance. Data are declared linear when Sig. Deviation from Linearity > 0.05.

**Table 3**
*Linearity Test Results for $X_1$ toward Y*

| Variable | Sig Linierity | Sig. Deviation From Linierity | Description |
|---|---|---|---|
| Entrepreneurship Education | 0,000 | 0,340 | Linier |

Source: Primary data processed by researcher (2024)

Based on Table 3, linearity values are 0.000 < 0.05 and Deviation from Linearity values are 0.340 > 0.05. These data indicate good linear relationships between entrepreneurship education variables ($X_1$) and entrepreneurial mindset variables (Y).

T-tests were used to determine whether independent variables influence dependent variables partially. Testing employed SPSS 25 programs, comparing t-calculated > t-table with 0.05 significance levels.

**Table 4**
*T-Test Results*

| Model | $t_{calculated}$ | Significance Value | Description |
|---|---|---|---|
| Entrepeneurship Education | 10,453 | 0,000 | Signifikan |
| Dependent Variable: Entrepreneurial Mindset | | | |

Source: Primary data processed by researcher (2024)

Based on Table 4, significance values for entrepreneurship education ($X_1$) effects on entrepreneurial mindset (Y) are 0.000 < 0.05, and t-calculated values are 10.453 > t-table 1.98932. Therefore, $H_0$ is rejected and $H_1$ is accepted, indicating that entrepreneurship education ($X_1$) influences entrepreneurial mindset (Y).

Linear regression analysis determines independent variable effects on dependent variables. Regression calculations in this research employed SPSS 25 assistance, with results presented in Table 5.

**Table 5**
*Linear Regression Analysis Results*

| Model | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | t | Sig. |
|---|---|---|---|---|---|
| (Constant) | 11,821 | 1,272 | | 9,296 | ,000 |
| Entrepreneurship Education | ,687 | ,066 | ,754 | 10.453 | ,000 |

Source: Primary data processed by researcher (2024)

Based on Table 5: (1) Constant values of 11.821 indicate that when Entrepreneurship Education ($X_1$) values equal 0, entrepreneurial mindset (Y) will be at 11.821; (2) Entrepreneurship education coefficient values ($X_1$) are 0.687, meaning average increases or decreases in entrepreneurial mindset for each entrepreneurship education unit are estimated at 0.687.

Determination coefficients determine independent variable influences or contributions to dependent variables based on R Square values. Determination coefficient results in this research are presented in Table 6.

**Table 6**
*Coefficient of Determination*

| R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|
| 0,754[a] | 0,568 | 0,563 | 1,176 |

Source: Primary data processed by researcher (2024)

From Table 6, R Square ($R^2$) values are 0.568, indicating that entrepreneurship education ($X_1$) influences entrepreneurial mindset (Y) by 56.8%, while 43.2% is influenced by other variables not explained in this research.

**Discussion**

Based on research analysis results, entrepreneurship education demonstrates positive

influences on entrepreneurial mindset among SMK Negeri 6 Surakarta students. This is evidenced using SPSS 25, where t-calculated values exceed t-table values (t-calculated 10.453 > t-table 1.98932) and significance values of 0.000 < 0.05. Based on these results, $H_0$ is rejected and $H_1$ is accepted. Therefore, positive and significant influences exist between entrepreneurship education and entrepreneurial mindset.

Individual entrepreneurial mindset can emerge and develop when they possess deep understanding of entrepreneurship. This understanding encompasses knowledge about business management, risk comprehension, and opportunity identification. This research aligns with previous findings by Ni and Ye (2018), Nisa and Murniawaty (2020), and Rachmawati et al. (2022), stating that entrepreneurship education plays important roles in building entrepreneurial thinking patterns.

Linear regression analysis results show entrepreneurship education regression coefficient values of 0.687, meaning each one-unit increase in entrepreneurship education will increase entrepreneurial mindset by 0.687 units. Therefore, better entrepreneurship education received by students results in more positive entrepreneurial thinking patterns they possess. This is supported by Kumar et al. (2023) research stating that structured entrepreneurship education can enhance students' creative thinking abilities, and Zhang et al. (2023) highlighting the importance of experience-based learning in developing entrepreneurial mindset.

The findings presented in Tables 2 through 6 collectively demonstrate the robust relationship between entrepreneurship education and entrepreneurial mindset development. The normality and linearity tests confirm the statistical validity of the analysis, while the regression results provide strong evidence for the positive impact of entrepreneurship education on student mindset formation.

## Conclusion

There is a positive and significant influence of entrepreneurship education on entrepreneurial mindset among Grade XII Office Management students at SMK Negeri 6 Surakarta. This is evidenced by t-test calculation results showing t-calculated 10.453 > t-table 1.98932 with significance values 0.000 < 0.05, leading to $H_0$ rejection and $H_1$ acceptance. This proves that entrepreneurship education builds entrepreneurial mindset among Grade XII Office Management students at SMK Negeri 6 Surakarta, aligning with Machali's (2012) opinion that entrepreneurship education represents efforts to enhance student potential and form independent, creative, risk-taking, innovative, honest, disciplined, hardworking, leadership-oriented, responsible characters capable of seizing opportunities. The sample used in this research was also limited; therefore, future researchers are expected to reveal other factors influencing entrepreneurial mindset and increase the number of samples to be studied. The study's findings, as demonstrated through the comprehensive analysis presented in Tables 1-6, provide strong evidence for the effectiveness of entrepreneurship education programs in developing entrepreneurial thinking patterns among vocational students. Future research should consider expanding the scope to include multiple vocational schools, longitudinal studies to track mindset development over time, and qualitative components to better understand the mechanisms through which entrepreneurship education influences student thinking patterns. Additionally, investigating the specific components of entrepreneurship education that most effectively contribute to mindset development would provide valuable insights for curriculum designers and educators.

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# Effects of entrepreneurship education and green entrepreneurial self-efficacy on green entrepreneurial intentions

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## Abstrak

*Penelitian ini bertujuan untuk mengetahui Pengaruh Entrepreneurship Education dan Green Entrepreneurial Self-Efficacy terhadap Green Entrepreneurial Intentions pada mahasiswa. Penelitian ini menggunakan pendekatan kuantitatif korelasional, dengan teknik pengambilan sampel yaitu stratified sampling dan incidental sampling. Sampel yang digunakan dalam penelitian ini adalah sebanyak 120 mahasiswa. Teknik pengumpulan data menggunakan kuesioner. Teknik analisis data yang digunakan adalah analisis dengan pendekatan PLS-SEM. Temuan penelitian ini menunjukkan bahwa entrepreneurship education berpengaruh positif signifikan terhadap green entrepreneurial intentions dan green entrepreneurial self-efficacy. Green entrepreneurial self-efficacy juga ditemukan memiiki pengaruh positif dan signifikan terhadap green entrepreneurial intentions mahasiswa. Selain itu, dengan pengaruh mediasi oleh green entrepreneurial self-efficacy diantara entrepreneurship education dan green entrepreneurial intentions menunjukkan hasil yang positif dan signifikan.*

*Kata kunci: efikasi diri kewirausahaan hijau; niat kewirausahaan hijau; pendidikan kewirausahaan*

## Abstract

This study aims to investigate the influence of entrepreneurship education and green entrepreneurial self-efficacy on green entrepreneurial intentions among university students. This research employed a quantitative correlational approach, utilizing stratified sampling and incidental sampling techniques. The sample consisted of 120 students, with data collected through questionnaires and analyzed using PLS-SEM approach. Findings indicate that entrepreneurship education has a significant positive effect on both green entrepreneurial intentions and green entrepreneurial self-efficacy. Green entrepreneurial self-efficacy was also found to have a positive and significant effect on students' green entrepreneurial intentions. Additionally, the mediation effect of green entrepreneurial self-efficacy between entrepreneurship education and green entrepreneurial intentions showed positive and significant results. These findings

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contribute to understanding the mechanisms through which entrepreneurship education influences sustainable business intentions and highlight the critical role of self-efficacy in fostering environmentally conscious entrepreneurial behavior among university students.

## Introduction

The issue of increasing societal entrepreneurial interest has significant impacts on national economic growth. A phenomenon arising from this issue is the asymmetry between economic growth and environmental quality. Ghifary et al. (2022) revealed that economic advancement and environmental preservation represent misaligned objectives. Research conducted by Khoiriyah (2021) indicates that public awareness regarding waste management and environmental cleanliness remains low. This low level of human resource awareness results in scarce interest and awareness toward sustainable business development in the future.

Hinderer and Kuckertz (2022) argue that various environmental pollution caused by industrialization activities necessitates business sector transformation toward environmentally friendly businesses or sustainable entrepreneurship (green entrepreneurship). Green entrepreneurship serves as the primary gateway for initiating sustainable development transformation, as it is considered a solution to environmental degradation (Sreenivasan & Suresh, 2023). Despite being an important solution for environmentally friendly economic sustainability, the green entrepreneurship concept remains unpopular in the economic industry (Wahyuningdyah & Susilowati, 2022).

Similar problems occur among university students. Based on preliminary survey data from 20 respondents—students from several study programs at the Faculty of Teacher Training and Education at Sebelas Maret University—60% of respondents stated they were not interested and did not want to start businesses adopting green entrepreneurship concepts. Furthermore, 75% of respondents admitted never hearing about green entrepreneurship concepts. From this preliminary survey, it can be concluded that green entrepreneurial intentions among Faculty of Teacher Training and Education students at Sebelas Maret University remain very low, requiring immediate efforts for improvement.

Green entrepreneurial intentions represent the integration of green entrepreneurship concepts with the term "intentions." Green entrepreneurship concept refers to entrepreneurship activities that consider all elements involved in entrepreneurship activities aimed at creating environmental benefits (Fadila et al., 2024). According to Agu et al. (2021), green entrepreneurial intentions represent mental conditions showing individual beliefs and commitments in efforts to build new businesses in the future while integrating economic, social, and environmental values. Individual thinking in achieving goals is influenced by attention and actions, so decisions to become entrepreneurs are formed through entrepreneurial experiences, attention, and actions (Nuringsih et al., 2022). From these explanations, green entrepreneurial intentions are interpreted as individual intentions and desires to start new businesses aimed at maintaining environmental sustainability while maximizing financial profits.

One factor suspected to influence green entrepreneurial intentions is entrepreneurship education. According to Alamsyahrir and Ie (2022), entrepreneurship education represents activity processes such as developing thinking patterns, instilling values and attitudes, skills, and entrepreneurship experiences to achieve entrepreneurship processes. Through entrepreneurship

education, students can acquire knowledge about green entrepreneurship, tending to generate student enthusiasm for starting their green entrepreneurship activities (Ediagbonya et al., 2024). Effective entrepreneurship education can increase awareness of environmental sustainability importance and inspire students to create innovative and environmentally friendly business solutions.

Another factor considered important is green entrepreneurial self-efficacy. Green entrepreneurial self-efficacy refers to individual beliefs in their abilities to succeed as green entrepreneurship practitioners (Alvarez-Risco et al., 2021). Students with high self-efficacy levels tend to have higher confidence and beliefs in facing challenges, making them more optimistic in achieving business goals (Sudimantoro et al., 2023).

Therefore, entrepreneurship education and green entrepreneurial self-efficacy factors are suspected to play roles in forming green entrepreneurial intentions among students (Li et al., 2023). Consequently, researchers aim to investigate further "The Influence of Entrepreneurship Education and Green Entrepreneurial Self-Efficacy on Green Entrepreneurial Intentions among Faculty of Teacher Training and Education Students at Sebelas Maret University." Research findings are expected to provide new insights for developing more effective learning strategies to enhance green entrepreneurial intentions among students.

## Research Methods

This research was conducted at the Faculty of Teacher Training and Education, Sebelas Maret University, located at Jalan Ir. Sutami No. 36, Jebres. This study employed a quantitative correlational approach. The selection of quantitative approach with correlational methods was based on alignment with research objectives, namely analyzing relationships between established variables.

The research population involved all Faculty of Teacher Training and Education students at Sebelas Maret University from the 2021 cohort, totaling 1,966 students from 24 study programs. The research sample consisted of 120 students from 24 study programs. Sample calculation used A-Priori Sample Size methods. Data collection techniques employed closed questionnaires with 5-point Likert scales ranging from Strongly Disagree to Strongly Agree. Research instruments were adaptations from previous studies, with all variables adapting statement items from Mambali et al. (2024).

Three requirement tests were conducted. First, measurement model testing (outer model) including reliability tests, convergent validity, and discriminant validity. Second, model fit testing. Third, structural model testing (inner model) including R-square and Q-square. After obtained data met requirement tests, hypothesis testing was conducted using bootstrapping methods to determine t-statistic and p-values.

## Results and Discussion

### Research Results

Data analysis through PLS-SEM was conducted in four stages: measurement model testing (outer model), model fit testing, structural model testing (inner model), and hypothesis testing.

### Measurement Model Testing (Outer Model)

Table 1 presents the convergent validity and reliability test results, demonstrating the measurement quality of all research constructs. Reliability measurement can be evaluated using Cronbach's Alpha (CA) and Composite Reliability (CR) values. Test results are considered reliable when Cronbach's alpha values > 0.7 and composite reliability values > 0.7 (Yovieta et al., 2022). As shown in Table 1, Cronbach's alpha values for each construct demonstrate good reliability, with all values exceeding the minimum threshold of 0.7. Green entrepreneurial intentions show Cronbach's alpha > 0.7 at 0.894, reflecting good construct reliability for measuring student green entrepreneurial intentions levels. Entrepreneurship education achieves Cronbach's alpha > 0.7 at 0.864, reflecting good construct reliability with consistent responses in entrepreneurship education variable

measurement. Similarly, green entrepreneurial self-efficacy shows Cronbach's alpha > 0.7 at 0.793, reflecting good construct reliability in measuring student green entrepreneurial self-efficacy levels.

**Table 1**
*Convergent Validity and Reliability Test Results*

| Variable | Item | Loadings | CA | CR | AVE |
|---|---|---|---|---|---|
| *Green Entrepreneurial Intentions* (GEI) | GEI 1 | 0.834 | 0.894 | 0.922 | 0.703 |
| | GEI2 | 0.843 | | | |
| | GEI3 | 0.848 | | | |
| | GEI4 | 0.842 | | | |
| | GEI5 | 0.826 | | | |
| *Entrepreneurship Education* (EE) | EE1 | 0.856 | 0.864 | 0.907 | 0.710 |
| | EE2 | 0.847 | | | |
| | EE3 | 0.840 | | | |
| | EE4 | 0.828 | | | |
| *Green Entrepreneurial Self-Efficacy* (GESE) | GESE1 | 0.835 | 0.793 | 0.879 | 0.707 |
| | GESE2 | 0.858 | | | |
| | GESE3 | 0.829 | | | |

Source: Primary data, processed by researcher (2025)

Composite reliability values for each construct exceed the minimum threshold of 0.7, interpretable as high construct reliability. Green entrepreneurial intentions show composite reliability > 0.7 at 0.922, reflecting good construct reliability in measuring student green entrepreneurial intentions levels. Entrepreneurship education shows composite reliability > 0.7 at 0.907, indicating that all items consistently measure entrepreneurship education. Similarly, green entrepreneurial self-efficacy composite reliability values reach > 0.7 at 0.879, strengthening construct reliability in representing student green entrepreneurial self-efficacy levels.

Convergent validity measurement can be evaluated using item loadings and Average Variance Extracted (AVE) values. Test results are considered valid when indicator loading values > 0.7 and AVE values > 0.5 (Theofadilla & Handoyo, 2024). Item loading values for all construct statements exceed recommended minimum thresholds of 0.7, indicating that all items have good validity in explaining their latent variables. Therefore, each statement item has strong correlations with their respective constructs. High item loading values indicate that each statement item effectively ensures accuracy levels in representing models.

Average Variance Extracted (AVE) values for all constructs also meet minimum thresholds of 0.5, supporting each construct's convergent validity. AVE values for green entrepreneurial intentions are 0.703, reflecting that constructs are well represented by their items. Entrepreneurship education shows AVE values of 0.710, confirming that all items can represent constructs well. Green entrepreneurial self-efficacy AVE values also show > 0.5 at 0.707, indicating that statement items can represent constructs well.

Discriminant validity testing can be conducted using Fornell-Larcker Criterion and Heterotrait-Monotrait-Ratio (HTMT) approaches. Variables are considered to pass discriminant validity tests when Fornell-Larcker criterion correlations between variables and themselves are higher than correlations between variables and other variables, with HTMT values < 0.9 (Theofadilla & Handoyo, 2024). Table 2 presents the Fornell-Larcker Criterion test results, assessing discriminant validity through correlation comparisons.

**Table 2**
*Fornell-Larcker Criterion Test*

|       | EE    | GEI   | GESE  |
|-------|-------|-------|-------|
| EE    | 0.843 |       |       |
| GEI   | 0.745 | 0.839 |       |
| GESE  | 0.650 | 0.709 | 0.841 |

Source: Primary data, processed by researcher (2025)

Fornell-Larcker criterion testing requires square root AVE values for each construct to be higher than correlations with other constructs. In Table 2, square root AVE values for each construct are higher than correlations with other constructs, indicating that constructs are sufficiently different from each other, confirming that constructs have high discriminant validity. Table 3 presents the HTMT test results, providing additional validation of discriminant validity across all construct pairs.

**Tabel 3**
*HTMT Test*

|       | EE    | GEI   | GESE  |
|-------|-------|-------|-------|
| EE    |       |       |       |
| GEI   | 0.842 |       |       |
| GESE  | 0.781 | 0.839 |       |

Source: Primary data, processed by researcher (2025)

HTMT testing is conducted to further measure construct discriminant validity. HTMT ratios evaluate similarity levels between constructs with maximum thresholds of 0.9. In Table 3, HTMT values for all construct pairs are below 0.9 thresholds, confirming that constructs have adequate discriminant validity levels.

**Model Fit Testing**

Model fit testing is used to evaluate whether hypothesized models can represent observed data. Table 4 presents model fit test results, demonstrating the overall model quality and its alignment with observed data.

**Tabel 4**
*Model Fit Test*

|            | Saturated Model | Estimated Model |
|------------|-----------------|-----------------|
| SRMR       | 0.064           | 0.064           |
| d_ULS      | 0.319           | 0.319           |
| d_G        | 0.191           | 0.191           |
| Chl-square | 133.719         | 133.719         |
| NFI        | 0.852           | 0.852           |

Source: Primary data, processed by researcher (2025)

Standardized Root Mean Square Residual (SRMR) measuring saturated and estimated models can be considered model fit when values < 0.08 (Husodo, 2018). In this research, SRMR values show 0.064, interpretable as achieving acceptable fit levels. Therefore, models have low errors, so hypothesized models have good fit with data, meaning they can represent observed data. According to the official Smart-PLS website, Unweighted Least Squares discrepancy (d_ULS) and Geodesic discrepancy (d_G) are not associated with any values (Ringle et al., 2024). The official Smart-PLS website also states that Chi-square values from proposed models do not provide sufficient information for assessing model fit, so Normed Fit Index (NFI) uses Chi-square values from null models as benchmarks (Ringle et al., 2024). NFI values compare proposed model fit with null models, where fit can be accepted when values > 0.8. Models are considered good fit when NFI values ≥ 0.9 and fit marginal when $0.8 \leq NFI \leq 0.9$ (Utomo et al., 2023). In Table 4, NFI values reach 0.852, confirming that models have good data explanation capabilities. Therefore, NFI

values of 0.852 indicate that approximately 85.2% of data variance can be explained by developed structural models, concluding that models are considered fit.

**Structural Model Testing (Inner Model)**

Inner model testing in this research uses determination coefficient (R Square) and Q Square values. Table 5 presents the inner model test results, showing the explanatory power and predictive relevance of the structural model.

**Tabel 5**

*Inner Model Test*

|  | R-Square | R-Square Adjusted | $Q^2$ |
|---|---|---|---|
| GEI | 0.642 | 0.636 | 0.445 |
| GESE | 0.422 | 0.417 | 0.294 |

Source: Primary data, processed by researcher (2025)

$R^2$ values are used to measure explanation levels, where $R^2$ value boundary criteria are divided into three classifications: 0.19 as weak criteria, 0.33 as moderate criteria, and 0.67 as strong criteria (Musyaffi et al., 2022). In this research, $R^2$ values for green entrepreneurial intentions are 0.642, indicating moderate categories, concluding that approximately 64.2% of green entrepreneurial intentions variance is explained by exogenous variables entrepreneurship education and green entrepreneurial self-efficacy while remaining 35.8% is explained by other factors. $R^2$ values for green entrepreneurial self-efficacy are 0.422, indicating moderate categories, concluding that approximately 42.2% of green entrepreneurial self-efficacy variance is explained by exogenous variables entrepreneurship education while remaining 57.8% is explained by other factors.

Besides assessing explanation power, model predictive relevance is evaluated using $Q^2$ values. According to Musyaffi et al. (2022), $Q^2$ values have predictive relevance provisions of 0.02, 0.15, and 0.35 to indicate that models have weak, moderate, and strong predictive relevance levels. In this research, $Q^2$ values for green entrepreneurial intentions are 0.445, categorizable as strong prediction capabilities, concluding that 44.5% variance can be predicted by developed structural models. $Q^2$ values for green entrepreneurial self-efficacy are 0.294, categorized as moderate, concluding that 29.4% variance can be predicted by structural models.

**Hypothesis Testing**

To determine significance levels of influences given by exogenous variables on endogenous variables, hypothesis testing was conducted. Table 6 presents the hypothesis testing results, demonstrating the statistical significance and direction of relationships between research variables.

**Table 6**

*Hypothesis Testing Results*

|  |  | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (\|O/STDEV\|) | P Values |
|---|---|---|---|---|---|---|
| H1 | EE -> GEI | 0.493 | 0.493 | 0.091 | 5.408 | 0.000 |
| H2 | GESE -> GEI | 0.388 | 0.390 | 0.080 | 4.867 | 0.000 |
| H3 | EE -> GESE | 0.650 | 0.655 | 0.055 | 11.829 | 0.000 |
| H4 | EE -> GESE -> GEI | 0.252 | 0.257 | 0.062 | 4.056 | 0.000 |

Source: Primary data, processed by researcher (2025)

EE $\rightarrow$ GEI testing shows T Statistics > 1.96 at 5.408 and P Values < 0.05 at 0.000, so $H_0$ is rejected and $H_1$ is accepted. Original Sample (O) calculations show 0.493 values, stating positive relationships in EE $\rightarrow$ GEI testing. Therefore, entrepreneurship education has positive and significant effects on green entrepreneurial intentions. Test results reveal that hypothesis 1 "There is Positive and Significant Influence of Entrepreneurship Education on Green Entrepreneurial

Intentions among Faculty of Teacher Training and Education Students at Sebelas Maret University" has been proven true.

GESE → GEI testing shows T Statistics > 1.96 at 4.867 and P Values < 0.05 at 0.000, so $H_0$ is rejected and $H_1$ is accepted. Original Sample (O) calculations show 0.388 values, stating positive relationships in GESE → GEI testing. Therefore, green entrepreneurial self-efficacy has positive and significant effects on green entrepreneurial intentions. Test results reveal that hypothesis 2 "There is Positive and Significant Influence of Green Entrepreneurial Self-Efficacy on Green Entrepreneurial Intentions among Faculty of Teacher Training and Education Students at Sebelas Maret University" has been confirmed true.

EE → GESE testing shows T Statistics > 1.96 at 11.829 and P Values < 0.05 at 0.000, so $H_0$ is rejected and $H_1$ is accepted. Original Sample (O) calculations show 0.650 values, stating positive relationships in EE → GESE testing. Therefore, entrepreneurship education has positive and significant effects on green entrepreneurial self-efficacy. Test results reveal that hypothesis 3 "There is Positive and Significant Influence of Entrepreneurship Education on Green Entrepreneurial Self-Efficacy among Faculty of Teacher Training and Education Students at Sebelas Maret University" has been proven true.

EE → GESE → GEI hypothesis testing shows T Statistics > 1.96 at 4.056 and P Values < 0.05 at 0.000, so $H_0$ is rejected and $H_1$ is accepted. Original Sample (O) calculations show 0.252 values, stating positive relationships in EE → GESE → GEI testing. Therefore, entrepreneurship education has positive and significant effects on green entrepreneurial intentions through green entrepreneurial self-efficacy mediation. Test results reveal that hypothesis 4 "There is Positive and Significant Influence of Entrepreneurship Education on Green Entrepreneurial Intentions through Green Entrepreneurial Self-Efficacy Mediation among Faculty of Teacher Training and Education Students at Sebelas Maret University" has been confirmed true.

**Discussion**

First hypothesis testing results prove that entrepreneurship education has positive and significant effects on green entrepreneurial intentions. The first hypothesis indicates that when entrepreneurship education increases, green entrepreneurial intentions also increase. Therefore, entrepreneurship education is clearly needed to enhance green entrepreneurial intentions among students. This aligns with previous research by Blegur and Handoyo (2020), Fadila et al. (2024), Aeni et al. (2024), Santika et al. (2024), and Mambali et al. (2024). Entrepreneurship education has positive and significant influences on green entrepreneurial intentions among students. Through sustainability principle integration in curricula, relevant learning experience provision, and social and environmental responsibility value formation, this education empowers students to identify green entrepreneurship opportunities, develop innovative solutions, and have strong motivations to start businesses contributing to environmental sustainability.

Second hypothesis testing results prove that green entrepreneurial self-efficacy has positive and significant effects on green entrepreneurial intentions. The second hypothesis indicates that when green entrepreneurial self-efficacy increases, green entrepreneurial intentions also increase. Therefore, green entrepreneurial self-efficacy is clearly needed to enhance green entrepreneurial intentions among students. This aligns with previous research by Qadir and Chaudhry (2024), Ediagbonya (2023), Guo (2022), Maryani and Supardi (2023), and Mambali et al. (2024). Green entrepreneurial self-efficacy represents crucial psychological factors in encouraging green entrepreneurial intentions among students. Strong beliefs in self-abilities to succeed in green entrepreneurship directly influence student motivation, persistence, and perceptions of opportunities and challenges in this field.

Third hypothesis testing results prove that entrepreneurship education has positive and significant effects on green entrepreneurial self-efficacy. The third hypothesis indicates that when entrepreneurship education increases, green entrepreneurial self-efficacy also increases. Therefore, entrepreneurship education is clearly needed to enhance green entrepreneurial self-efficacy among students. Previous research consistently shows that entrepreneurship education plays important roles in increasing individual green entrepreneurial self-efficacy. Rahmanto et al. (2024), Le et al. (2023),

Li and Wu (2019), Soomro and Shah (2022), and Mambali et al. (2024) suggest positive and significant relationships between entrepreneurship education and green entrepreneurial self-efficacy.

Fourth hypothesis testing results prove that entrepreneurship education has positive and significant effects on green entrepreneurial intentions through green entrepreneurial self-efficacy mediation. The fourth hypothesis indicates that when entrepreneurship education increases, green entrepreneurial self-efficacy also increases, impacting green entrepreneurial intentions increases. Therefore, entrepreneurship education is clearly needed to enhance green entrepreneurial self-efficacy, which subsequently increases green entrepreneurial intentions among students. Research shows that entrepreneurship education not only increases green entrepreneurial intentions directly but also through deeper mechanisms. Research by Putra and Nugroho (2023), Maheswari and Kha (2022), Kabung'a (2023), Wu et al. (2022), and Mambali et al. (2024) found that green entrepreneurial self-efficacy shows positive and significant mediation effects on relationships between entrepreneurship education and green entrepreneurial intentions.

## Conclusion

Based on research results, several conclusions can be drawn: (1) There is positive and significant influence of entrepreneurship education on green entrepreneurial intentions. Entrepreneurship education serves as a facilitator in introducing green entrepreneurship and is responsible for increasing student awareness toward environmentally sustainable businesses. (2) There is positive and significant influence of green entrepreneurial self-efficacy on green entrepreneurial intentions. Students with green entrepreneurial self-efficacy tend to have beliefs in solving environmental sustainability problems through entrepreneurship activities. (3) There is positive and significant influence of entrepreneurship education on green entrepreneurial self-efficacy. Environmental sustainability values obtained from entrepreneurship education equip students with insights and experiences regarding green entrepreneurship concepts. (4) There is positive and significant influence of entrepreneurship education on green entrepreneurial intentions through green entrepreneurial self-efficacy mediation. Students receiving entrepreneurship education will have extensive knowledge, insights, and experiences regarding green entrepreneurship. However, entrepreneurship education not accompanied by green entrepreneurial self-efficacy is insufficient for realizing and developing green entrepreneurship. Quality entrepreneurship education implementation will influence green entrepreneurial self-efficacy, triggering increased green entrepreneurial intentions among students. This research still has limitations that can serve as evaluation materials for future research. Higher education institutions are expected to develop entrepreneurship education implementation models more focused on sustainability concepts, so green entrepreneurship values are not only applied in entrepreneurship courses but also in non-entrepreneurship courses. Educators are also expected to integrate sustainability values in entrepreneurship learning module preparation and implement learning models capable of increasing student sustainability orientations. Students are expected to enrich knowledge regarding factors influencing green entrepreneurial intentions and strive to participate in realizing sustainable entrepreneurship activities by utilizing facilities provided by higher education institutions and actively participating in training to support green entrepreneurial intentions development. Future research should consider other variables influencing green entrepreneurial intentions, such as economic factors and government policies. Qualitative research should be used to gain deep understanding regarding student experiences and perceptions related to green entrepreneurship.

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# Implementation of video-based think-pair-share method to enhance industrial relations learning outcomes among vocational school students

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### *Abstrak*

*Tujuan penelitian ini adalah meningkatkan hasil belajar siswa kelas XI MPLB SMK Bhakti Karya Karanganyar pada materi hubungan industrial. Penelitian ini menggunakan metode Penelitian Tindakan Kelas (PTK) yang dilaksanakan sebanyak tiga siklus, masing-masing siklus terdiri dari dua kali pertemuan. Untuk mendukung pendekatan pembelajaran digunakan video pembelajaran yang dipadukan dengan metode think-pair-share. Subjek penelitian ini adalah guru dan siswa kelas XI MPLB SMK Bhakti Karya. Fokus penelitian ini adalah pada hasil belajar siswa, aktivitas siswa dalam proses pembelajaran, dan keterampilan mengajar guru. Penelitian ini menggunakan pendekatan tes dan non-tes untuk memperoleh data. Instrumen tes menghasilkan data kuantitatif berupa nilai hasil belajar siswa, sedangkan instrumen non-tes, seperti lembar observasi aktivitas siswa dan keterampilan guru, menghasilkan data kualitatif. Hasil penelitian menunjukkan adanya peningkatan pada ketiga aspek tersebut dari siklus I hingga siklus III. Rata-rata kecakapan guru meningkat dari kategori baik menjadi sangat baik, yaitu dari 2,37 menjadi 3,75. Aktivitas siswa dalam pembelajaran juga meningkat, dengan rata-rata nilai dari 25,87 menjadi 27,30. Nilai rata-rata hasil belajar siswa meningkat dari 50 menjadi 80, dan pada siklus III, tingkat ketuntasan belajar mencapai 84,84%. Penerapan think-pair-share berbasis video pembelajaran meningkatkan kualitas proses pembelajaran dan hasil belajar siswa dalam materi hubungan industrial, menurut temuan penelitian.*

*Kata kunci: aktivitas belajar; hasil belajar; penelitian tindakan kelas; think-pair-share; video pembelajaran*

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**Abstract**

This study aimed to enhance the learning outcomes of Grade XI Office Administration and Business Services (OABS) students at SMK Bhakti Karya Karanganyar in Industrial Relations subject matter. Methods: A Classroom Action Research (CAR) methodology was employed, implemented across three cycles with two meetings per cycle. Video-based learning was integrated with the think-pair-share instructional method to support the pedagogical approach. The research subjects comprised the teacher and 33 students from Grade XI OABS at SMK Bhakti Karya. The investigation focused on three key aspects: student learning outcomes, student engagement during the learning process, and teacher instructional competencies. Data Collection: Both quantitative and qualitative data collection instruments were utilized. Test instruments generated quantitative data on student achievement, while non-test instruments, including student activity observation sheets and teacher performance evaluation forms, provided qualitative insights. Results: The findings demonstrated consistent improvements across all three measured aspects from Cycle I through Cycle III. Teacher instructional competency advanced from "good" to "excellent" categories, with average scores increasing from 2.37 to 3.75. Student engagement showed notable enhancement, with average scores rising from 25.87 to 27.30. Most significantly, student learning outcomes improved substantially, with mean scores increasing from 50 to 80, and learning mastery rates reaching 84.84% in Cycle III. Conclusion: The implementation of video-based think-pair-share methodology successfully enhanced both the quality of the instructional process and student learning outcomes in Industrial Relations subject matter.

## Introduction

Vocational Senior High Schools (SMK) are designed to prepare students as competent and skilled workers ready for higher education or immediate workforce entry (Abdurrohman & Mahmudahi, 2022). Consequently, SMK education emphasizes practical skill mastery coupled with critical thinking capabilities essential for addressing workplace and industrial challenges. This competency enhancement is exemplified through the Human Resource Management curriculum, specifically the Industrial Relations subject matter, which plays a crucial role in preparing students for workplace relationship dynamics.

Industrial relations can be defined as a system governing relationships among workers, employers, and government entities within the work environment, as stipulated in Law No. 13 of 2003 concerning Employment. A comprehensive understanding of this concept is particularly vital for SMK students, especially those in the Office Administration and Business Services (OABS) program, given their prospective roles as administrative personnel directly interfacing with employment aspects in business and industrial settings. Therefore, this subject is taught to Grade XI OABS students at SMK Bhakti Karya. However, implementation has revealed several constraints

affecting classroom learning effectiveness, including limited student active participation during the learning process, insufficient infrastructure resulting in restricted learning media availability, and lecture-dominant teaching methods that induce student boredom and diminish critical thinking. These factors contribute to suboptimal student learning outcomes, particularly when addressing contextual and abstract content such as industrial relations.

Student achievement levels in meeting established learning objectives serve as crucial indicators of instructional process effectiveness. According to Nurita (2018), the selection of appropriate learning models or methods represents one of the primary factors influencing learning outcomes. Effective pedagogical approaches enhance student comprehension of subject matter. Learning achievement can be characterized as a fundamental component of the educational process that demonstrates students' success in meeting teacher-established learning objectives. As Nurita (2018) emphasized, learning model or method selection significantly impacts learning outcomes, with effective methodological choices enhancing student understanding of instructional content.

Classroom media utilization substantially supports student comprehension of abstract concepts. Furthermore, appropriate resource selection in the educational process can enhance student motivation to learn, thereby influencing academic outcomes. Rahman et al. (2023) assert that video can be considered an instructional delivery process supporting students in achieving learning objectives across affective, cognitive, and psychomotor domains. Educational videos can be independently designed by teachers to transform abstract learning materials into more engaging and contextual content. Video utilization combining visual and auditory elements can facilitate student understanding of industrial relations concepts that may be difficult to comprehend through lecture-only approaches. Additionally, video implementation can simultaneously accommodate visual, auditory, and kinesthetic learning styles. This model provides stimuli for student thinking and peer interaction, creating more enjoyable and meaningful learning experiences. This aligns with previous research findings. Earlier research published by Rachmawati and Erwin (2022) demonstrated that the think-pair-share paradigm supported by video effectively enhanced student understanding of Indonesian Language instruction. Similarly, research conducted by Ardianti et al. (2016) showed comparable results, with this model and media improving student learning outcomes in living organism classification materials. Similar findings were reported by Putri and Winanto (2023), who proved that the think-pair-share model with video media enhanced active participation and student learning outcomes. Although many studies have been conducted at the elementary school level, similar strategies can be applied at the vocational school (SMK) level, as this method and media demonstrate significant potential and suitability for Human Resource Management subject matter requiring contextual visualization and critical thinking from students.

Based on this background, classroom action research was conducted with the title "Implementation of Video-Based Think-Pair-Share to Enhance Grade XI OABS Student Learning Outcomes in Industrial Relations Subject Matter at SMK Bhakti Karya." This study aims to address identified challenges, shift focus from teacher-centered to student-centered approaches, and motivate all students to actively participate in learning activities, thereby creating more meaningful and enjoyable learning processes while ensuring learning objective achievement.

## Research Methods

This study employed Classroom Action Research (CAR) using the Kemmis and McTaggart model, comprising four stages: planning, action implementation, observation, and reflection (Mulyasa, 2019; Nanda et al., 2021). Actions were conducted across three cycles aimed at improving student learning outcomes, student engagement during the learning process, and teacher instructional competencies through video-based think-pair-share model implementation. Research subjects included 33 Grade XI OABS students at SMK Bhakti Karya Karanganyar for the 2024/2025 academic year, consisting of 5 males and 28 females, along with the subject teacher as the action implementer.

Data collection utilized both test and non-test instruments. Test instruments comprised multiple-choice questions administered after each cycle's actions to measure student learning outcomes. Non-test instruments included teacher observation sheets for assessing pedagogical

competencies and student observation sheets for evaluating learning activities. Data analysis employed both quantitative and qualitative approaches. Qualitative data were analyzed descriptively by classifying observation results into four categories: excellent, good, fair, and poor. This analysis assessed student activities during the learning process and teacher instructional competencies at each cycle's conclusion. Qualitative information was also obtained through completion percentages and observation result classifications. Meanwhile, quantitative data were analyzed by calculating average scores and student learning mastery percentages based on Minimum Mastery Criteria (KKM) at each cycle's end.

## Results and Discussion

### Research Results

As part of the learning evaluation process, observations were conducted on various important classroom aspects. This observation focus encompassed teacher competencies in managing learning, student engagement during the learning process, and cognitive learning achievement. Through this data, a comprehensive overview of learning implementation was expected to emerge. A summary of these observation results is presented in the following section:

**Table 1**
*Summary of Teacher Instructional Skills Assessment Across Cycles I, II, and III Based on Minister of National Education Regulation No. 16 of 2007 concerning Academic Qualification Standards and Teacher Competencies*

| No. | Indicator | Cycle I | Cycle II | Cycle III |
|---|---|---|---|---|
| 1. | Skill in opening lessons | 2 | 3 | 4 |
| 2. | Skill in explaining material with video assistance | 3 | 3 | 4 |
| 3. | Skill in creating variation in learning activities | 2 | 4 | 4 |
| 4. | Skill in asking higher-order questions (Thinking) | 2 | 3 | 4 |
| 5. | Skill in managing classroom effectively (Pairing) | 3 | 3 | 4 |
| 6. | Skill in guiding small group and individual discussions (Sharing) | 2 | 4 | 4 |
| 7. | Skill in providing reinforcement to student responses | 3 | 3 | 3 |
| 8. | Skill in systematically closing lessons | 2 | 3 | 3 |
| | Total Score | 19 | 26 | 30 |
| | Average Score | 2,37 | 3,25 | 3,75 |
| | Category | Baik | Sangat Baik | Sangat Baik |

As shown in Table 1, research employed teacher instructional skill classification based on a four-level scale, ranging from scores 1 to 4, developed with reference to learning observation instruments by Nanda et al. (2021) and Widodo (2020). This classification category was adapted to teacher pedagogical competency indicators as specified in Minister of National Education Regulation No. 16 of 2007 concerning Academic Qualification Standards and Teacher Competencies. The score classification categories are as follows: scores 3.51-4.00 (excellent), scores 2.51-3.50 (good), scores 1.51-2.50 (fair), and scores 1.00-1.50 (poor).

Based on observation results, teacher skills in teaching industrial relations materials using think-pair-share in Grade XI OABS learning at SMK Bhakti Karya Karanganyar improved across each cycle. Teacher skill scores increased by 7 points from cycle one to cycle two, with further improvement in cycle three adding 4 points from the previous cycle. Cycle three scores were classified as excellent, reflecting that teacher skills had achieved minimum success standards in the good category. Teacher skill indicators were developed based on fundamental teaching skill components, encompassing abilities to open and close lessons, ask questions, explain materials, manage classrooms, and guide small group discussions to enhance learning effectiveness (Irawati, 2020; Hamdani, 2019).

Improvements occurred as teachers made corrections in each cycle. In Cycle I, teachers were not yet optimal in opening and closing lessons, group discussions were ineffective, and questions posed did not elicit deep understanding. In Cycle II, teachers began creating learning variations, using higher-order questions, and more actively guiding small group discussions. Subsequently, in Cycle III, teachers successfully managed classrooms effectively, guided discussions systematically, opened and closed lessons appropriately, and explained materials clearly and engagingly. These skill improvements demonstrated increasing teacher proficiency in implementing video-based think-pair-share learning models, positively impacting student activity and learning outcome enhancement. Enhanced student activity results were accompanied by improved learning outcomes due to teacher competencies in managing learning activities. Table 2 presents the improvement in student activities during learning.

**Table 2**
*Summary of Student Activity Assessment Across Cycles I, II, and III*

| No. | Indicator | Cycle I | Cycle II | Cycle III |
|-----|-----------|---------|----------|-----------|
| 1. | Enthusiasm at the beginning of learning activities | 3,31 | 3,24 | 3.36 |
| 2. | Providing full attention to teacher explanations through learning videos | 3,21 | 3,21 | 3,48 |
| 3. | Finding and understanding new knowledge from learning media related to materials | 3,18 | 3,30 | 3,33 |
| 4. | Individual thinking (Thinking) | 3,27 | 3,30 | 3,54 |
| 5. | Working in groups (Pairing) | 3,24 | 3,42 | 3,39 |
| 6. | Presenting discussion results (Sharing) | 3,24 | 3,27 | 3,45 |
| 7. | Responding to reinforcement provided by teachers | 3,24 | 3,39 | 3,42 |
| 8. | Summarizing materials and completing evaluations | 3,15 | 3,27 | 3,30 |
| | Total Score | 854 | 872 | 901 |
| | Average Score | 25,87 | 26,42 | 27,30 |
| | Category | Baik | Baik | Sangat Baik |

Student activities in learning demonstrated improvement from Cycle I through Cycle III. Average scores increased from 25.87 (good) to 27.30 (excellent). This classification refers to four categories: excellent (3.25-4.00), good (2.50-3.24), fair (1.75-2.49), and poor (1.00-1.74), as adapted from Minister of National Education Regulation No. 16 of 2007 and explained by Widodo (2020).

Enhanced student activities were influenced by improved learning strategies in each cycle. In Cycle I, some students remained passive and unaccustomed to the think-pair-share flow. In Cycle II, teachers emphasized discussion flow clarification and improved time management between sessions (thinking, pairing, and sharing), resulting in more active student discussions and increased responsiveness. In Cycle III, teachers added triggering questions at video beginnings and provided

recognition for student participation, leading to comprehensive enthusiasm and engagement improvements.

Overall, observations of student learning activities during industrial relations materials using video-based think-pair-share models showed consistent improvement across each cycle. Average student activity scores in Cycle I were 25.87, categorized as good, increasing to 26.42 in Cycle II while remaining in the good category, then significantly improving to 27.30 in Cycle III, classified as excellent.

Student activity indicators in this research encompassed (1) visual activities, (2) speaking activities, (3) listening activities, (4) writing activities, (5) drawing activities, (6) movement activities, (7) thinking activities, and (8) emotional activities. These align with Paul B. Diedrich's classification in Ridwan (2020), who categorized student activities into eight groups. Jayusman and Shavab (2020) expressed similar views regarding student learning activity indicators.

**Table 3**
*Summary of Student Learning Achievement Across Cycles I, II, and III*

| No. | Description | Cycle I | Cycle II | Cycle III |
|-----|-------------|---------|----------|-----------|
| 1. | Class average score | 50 | 65 | 80 |
| 2. | Highest student score achieved | 60 | 70 | 90 |
| 3. | Lowest student score obtained | 40 | 50 | 70 |
| 4. | Number of students achieving KKM | 12 | 20 | 28 |
| 5. | Number of students scoring below KKM | 21 | 13 | 5 |
| 6. | Learning mastery percentage | 57,14% | 60,60% | 84,84% |
| | Total Score | 854 | 872 | 901 |
| | Average Score | 25,87 | 26,42 | 27,30 |
| | Category | Baik | Baik | Sangat Baik |

Average student activity scores displayed in the learning achievement table were intended to demonstrate relationships between learning processes and student cognitive learning achievements. These scores were obtained from observations during learning using student activity observation sheets based on activity indicators according to Paul B. Diedrich (in Ridwan, 2020), including thinking, speaking, writing, listening, and group work. Average student activities increased from 25.87 (Cycle I) to 26.42 (Cycle II) and 27.30 (Cycle III). This improvement aligned with increased average student cognitive learning scores from 50 to 80, indicating that higher student activities during learning processes correspond to higher learning achievements.

Enhanced student learning achievements across each cycle were inseparable from improved learning strategies implemented by teachers. In Cycle I, learning methods remained unidirectional, resulting in suboptimal student understanding. Student average scores were recorded at 50 with learning mastery rates of 57.14%, equivalent to 12 students achieving KKM. Entering Cycle II, teachers began maximizing learning video utilization and activating group discussions, increasing student engagement. Average scores improved to 65 in Cycle II with learning mastery of 60.60%, equivalent to 20 students achieving mastery. In Cycle III, teachers added triggering questions and provided reinforcement for student responses, resulting in enhanced student focus, activity, and understanding of materials. This was reflected in increased average student scores and learning mastery percentages reaching 84.84%, meaning 28 students successfully met KKM requirements.

**Discussion**

Video media utilization supports think-pair-share model effectiveness in optimizing student learning achievement, particularly for Grade XI OABS industrial relations materials. Learning

media function as supporting tools facilitating the learning process for both students and teachers. This media presence expands teacher roles in delivering materials more engagingly and comprehensibly. Learning media utilization aims to integrate three main aspects: affective, cognitive, and psychomotor, playing strategic roles in supporting comprehensive learning process success. For industrial relations materials, learning videos contained industrial relations definitions, characteristics, disputes, principles, cooperation, and employment agreements. These videos enabled student understanding through their interactive and engaging nature. According to Arikunto (2015), the cognitive domain in Bloom's taxonomy comprises six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation, where each level reflects thinking process complexity required in learning. Through these learning videos, students could acquire knowledge and understanding of industrial relations, subsequently conducting application, analysis, and evaluation through more directed think-pair-share activities. This condition aligned with improved student learning achievements evident from minimum mastery rates increasing from 12 students in Cycle I to 20 students in Cycle II and 28 students in Cycle III.

Teacher instructional skills in Cycle I remained suboptimal. Teachers were not yet fluent in opening and closing lessons and had not extensively used activity variations. Questions provided were also unable to encourage deeper student thinking, and group discussions remained ineffective. In Cycle II, changes occurred as teachers began adding video media to assist material explanations and actively guiding students during discussions. Questions asked directed toward critical thinking abilities. During Cycle III, teacher abilities further improved. Teachers could manage classrooms orderly, open and close lessons systematically, and guide discussions more purposefully. Overall, teacher instructional skills improved across each cycle, demonstrating successful reflection and improvement efforts.

Student activities during learning experienced clear development across each cycle. In Cycle I, some students remained silent and inactive due to unfamiliarity with the think-pair-share learning model. They appeared hesitant to discuss and were not fully focused during teacher explanations. Entering Cycle II, changes emerged. Teachers managed time better and provided clearer directions, enabling student involvement during individual thinking, peer discussions, and result presentations. In Cycle III, classroom atmosphere became more vibrant. Teachers provided engaging opening questions and appreciated active students, making students more enthusiastic, confident in expressing opinions, and more focused during learning. Overall, student activities increasingly improved from one cycle to the next.

Student learning achievements improved alongside enhanced teaching methods and increased student activity during learning. In Cycle I, student average scores remained low at 50, with only 12 students achieving mastery due to learning not yet actively involving students. In Cycle II, average scores increased to 65. Teachers began using learning videos and engaging students in group discussions, facilitating material comprehension. In Cycle III, average scores improved to 80, with most students achieving KKM. These improvements demonstrated that when students are actively involved and teachers can manage learning effectively, learning outcomes correspondingly improve.

Research findings indicate that video-based think-pair-share learning model implementation can enhance student learning outcomes in Industrial Relations subjects for Grade XI OABS students at SMK Bhakti Karya. These discoveries support research by Rachmawati and Erwin (2022), stating that think-pair-share model implementation with video support can strengthen student understanding in Indonesian Language subjects. Pamungkas et al. (2023) confirmed that this model significantly increases active student involvement and concept understanding. Other research by Ardianti et al. (2016) also demonstrated similar tendencies, showing improved student learning achievements in

living organism classification materials through similar model and media usage. Additionally, Kartikawati and Purwanti (2015) implemented think-pair-share approaches with video support at SDN Karangayu 02 Semarang City, with results showing increased student learning involvement, positively impacting learning outcome improvements and teacher skills in designing learning processes. Research conducted by Zulela et al. (2025) concluded that think-pair-share learning models proved effective in enhancing learning outcomes and student cooperation attitudes.

## Conclusion

This research demonstrates that video-based Think-Pair-Share model implementation can enhance student learning outcomes, student activities, and teacher instructional skills for Grade XI OABS industrial relations materials at SMK Bhakti Karya Karanganyar. Based on think-pair-share stage implementation, one cycle consisted of two meetings where students engaged in individual thinking, paired discussions, and group result sharing. Research findings indicate that student learning outcomes improved across each cycle. In Cycle I, 15 students (51.72%) achieved learning mastery in the first meeting, increasing to 21 students (72.41%) in the second meeting. In Cycle II, 25 students (86.21%) achieved learning mastery in the first meeting, increasing to 27 students (93.10%) in the second meeting. Additionally, teacher instructional skills improved from an average of 2.37 (good category) to 3.75 (excellent category). Student activities during learning processes increased from an average of 25.87 to 27.30, demonstrating higher student competencies across cycles. Improvements in each cycle indicated that video-based think-pair-share learning methodology proved effective in enhancing student interest and improving material understanding. These results were supported by classroom observations where most students appeared more enthusiastic during discussions and demonstrated confidence when expressing opinions.

Research limitations include: (1) constrained implementation time limitations, (2) learning strategies requiring adjustment to individual student learning styles, and (3) research focus limited to one class and one learning material. Future researchers are encouraged to conduct follow-up studies on different materials and grade levels, provide more detailed descriptions particularly regarding success indicator coverage including affective and psychomotor aspects, and employ more varied learning strategies.

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# Office administration internships, self-efficacy, and work readiness of PAP FKIP UNS students

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### Abstrak

*Penelitian ini bertujuan untuk mengetahui pengaruh magang administrasi dan self efficacy terhadap kesiapan kerja mahasiswa program studi pendidikan administrasi perkantoran FKIP UNS Angkatan 2021 baik secara simultan maupun parsial. Penelitian ini menggunakan pendekatan kuantitatif kausalitas. Populasi berjumlah 80 mahasiswa. Sampel penelitian menggunakan teknik sampling jenuh. Teknik pengumpulan data menggunakan angket. Teknik analisis data menggunakan teknik analisis regresi linear berganda dengan bantuan IBM SPSS Statistic 25. Hasil penelitian menunjukkan bahwa: (1) terdapat pengaruh positif dan signifikan magang administrasi terhadap kesiapan kerja mahasiswa dengan nilai $t_{hitung}$ (2.768) > $t_{tabel}$ (1.990) dan nilai signifikansi pada magang administrasi sebesar 0,007 < 0,05; (2) terdapat pengaruh positif dan signifikan self efficacy terhadap kesiapan kerja mahasiswa dengan nilai $t_{hitung}$ (6.609) > $t_{tabel}$ (1.990) dan nilai signifikansi pada self efficacy sebesar 0,000 < 0,05; (3) terdapat pengaruh positif dan signifikan magang administrasi dan self efficacy secara bersama-sama terhadap kesiapan kerja mahasiswa dengan nilai $F_{hitung}$ (37.813) > $F_{tabel}$ (3.11) dan nilai signifikansi sebesar 0,000 < 0,05. Persamaan regresi penelitian adalah Ŷ= 7,995 + 0,329$X_1$ + 0,803$X_2$ dengan nilai R Square sebesar 0,495. Kontribusi magang administrasi dan self efficacy secara bersama-sama dalam penelitian ini sebesar 49,5%.*

*Kata kunci: kepercayaan diri; kesiapan kerja; kuantitatif; magang administrasi*

### Abstract

This research aimed to determine the influence of administration internships and self-efficacy on work readiness among students in the Office Administration Education Program, Faculty of Teacher Training and Education, Sebelas Maret University, Class of 2021, both simultaneously and individually. We employed a quantitative causal approach with a population of 80 students. Saturated sampling technique was utilized for sample selection. Data were collected through questionnaires and analyzed using multiple linear regression analysis with IBM SPSS Statistics 25. Results indicated that: (1) administration internships had a positive and significant influence on students' work readiness (t = 2.768, p = .007); (2) self-efficacy had a positive and

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significant influence on students' work readiness (t = 6.609, p < .001); (3) administration internships and self-efficacy together had a positive and significant influence on students' work readiness (F = 37.813, p < .001). The regression equation was $\hat{Y} = 7.995 + 0.329X_1 + 0.803X_2$ with an $R^2$ value of 0.495. Administration internships and self-efficacy together contributed 49.5% to work readiness variance, while the remainder was influenced by other variables not included in this study.

## Introduction

Human resources play crucial roles in driving economic growth and development in countries, yet human resource quality in Indonesia remains relatively low (Wahyuni et al., 2023). This is evident from Indonesia's high unemployment rate. According to the Central Java Provincial Statistics Agency (2024), the Open Unemployment Rate for Central Java Province was 5.13% in 2023, decreasing to 4.78% in November 2024. While this percentage indicates decreased unemployment, university graduates constitute one of the largest contributors to national unemployment. The Open Unemployment Rate for university graduates in 2024 was 5.25%.

High unemployment rates result from various factors, including lack of readiness among individuals or students to enter the workforce and limited job opportunities (Azizah et al., 2019). This statement is reinforced by research conducted by Anthony Sediyono and Iriani (2020), which shows that most students remain unprepared to enter the workforce. This stems from absence of intention and dedication among students, including lack of study dedication, feelings of laziness, insufficient critical thinking, and many students failing to develop their potential outside class hours.

Hidayatulloh et al. (2021) define readiness as a state of maturity in which individuals possess abilities to make decisions, adapt to their environments, and solve problems. According to Zunita (2019), work readiness represents psychological and physical conditions in which individuals are prepared to face pressure and challenges after completing their studies and continuing to work.

Students should possess work readiness, especially final-year students who will face working world challenges after graduation. If students lack optimal work readiness levels, they will struggle to face realities that will occur in future working worlds (Devita Putri, 2024). A common phenomenon among final-year students involves not yet possessing optimal work readiness, which can lead to relatively high unemployment rates among university graduates or fresh graduates. Therefore, work readiness constitutes a key asset for individuals in preparing themselves to enter the workforce. Graduates who possess good work readiness and master various workplace-required skills can easily enter the workforce (Pambajeng et al., 2024). According to Azizah et al. (2019), students' work readiness can be developed after they achieve balance between maturity levels, prior experience, and balanced mental or emotional states.

Issues related to students' lack of readiness to enter the workforce have emerged in the Office Administration Education Program at the Faculty of Teacher Training and Education, Sebelas Maret University, Surakarta, Class of 2021. Students' readiness levels to enter the workforce remain relatively low. The following data on job readiness of PAP FKIP UNS students from the 2021 cohort were analyzed based on four aspects: career management skills, knowledge, presentation, and personal circumstances. Students exhibit low job readiness in three aspects: career management skills, with 70% of PAP students lacking clear career plans after graduation; knowledge, with 60% of PAP students lacking confidence that their knowledge and skills are sufficient to enter the workforce; and personal circumstances, with 70% of PAP students unprepared to face workforce challenges and uncertainties. This aspect explains personality traits that shape students' potential.

According to Kirani and Chusairi (2022), three factors can influence students' work readiness: personal (internal) factors, external factors, and educational factors. Internal factors originate from within individuals, such as interests, talents, self-confidence, and motivation. External factors relate to support from others, such as parental support, peer support, and work environments. Educational factors relate to learning processes undertaken by individuals, such as relevant internships or practical experience.

Internships are considered important educational factors in improving students' work readiness because through internships, students can improve both hard skills and soft skills, which serve as foundations for entering future workforces. According to Lestari and Ubaidillah (2022), internships are activities undertaken by individuals, whether students or trainees, to develop their skills both soft and hard through direct work experience at institutions or companies over specified periods. Cunha (2023) states that internship experiences can influence individuals' physiological development, including students' readiness to prepare themselves for workforces. Internship activities aim to enhance creativity, skills, provide workplace knowledge, and shape individuals who are ready to work.

The Office Administration Education Study Program at FKIP UNS has several internship programs, including office administration internships that provide hands-on work experience in both private and government institutions, giving students valuable experience before entering workforces. According to some PAP students who participated in office administration internships, short-term internships provide insight into professional worlds. However, office administration internship implementation still has issues that limit internship experiences gained by students, such as being assigned tasks that are too simple, like photocopying or filing documents without explanations of their administrative value; many students being assigned tasks during internships that are not relevant to their fields of expertise; and lack of student involvement in various tasks or their completion. These factors can result in internship experiences gained by students being less than optimal.

Another factor that can influence students' work readiness is their belief in their own abilities, or self-efficacy. According to Damayantie and Kustini (2022), self-efficacy is individuals' belief in their ability to control situations and achieve favorable results. Self-efficacy is an important personality component related to work readiness because it serves as one of the initial steps or foundational elements in undertaking any task. Individuals with high self-efficacy are better equipped to handle various situations or challenges (Kustini et al., 2021). Self-efficacy prepares students to enter workforces, enabling them to perform tasks effectively and to the best of their ability. Students with high self-efficacy can focus on specific matters, such as their work or aspirations (Damayantie & Kustini, 2022). Individuals with low self-efficacy are more likely to give up on challenges because they lack experience to overcome them (Fatmawati et al., 2023). Therefore, in workplaces, self-efficacy is crucial for addressing issues that arise on jobs.

Students who are unprepared to enter workforces will find it difficult to face various challenges that hinder their career development after graduation. Students will struggle to adapt to work environments. Work readiness indicators used in this study, according to Fitriyanto in Patimah and Sumaryoto (2024), include: (1) having physical and mental maturity; (2) having logical and objective judgment; (3) having workplace understanding; (4) being able to complete tasks; (5) having ability and willingness to collaborate with others; (6) having courage to accept individual responsibility. Work readiness is crucial to help students confidently tackle various workplace challenges with adequate competence gained from their experiences. Therefore, conducting further research on office administration internships' influence and self-efficacy on students' work readiness is important so that appropriate solutions can be found to enhance students' work readiness for entering real working worlds after graduation.

Based on the above description, we hypothesized that: (1) office administration internships have effects on work readiness of students in the Office Administration Education Study Program, FKIP UNS, Class of 2021; (2) self-efficacy has effects on work readiness of students in the Office Administration Education Study Program, Class of 2021; (3) office administration internships and self-efficacy have combined effects on work readiness of students in the Office Administration Education Program, Class of 2021. Therefore, we aimed to examine factors suspected to influence

work readiness, namely internship activities and self-efficacy. As previously explained, work readiness is crucial in helping students confidently face various workplace challenges with adequate competencies gained from their experiences. Thus, we investigated "Office Administration Internships, Self-Efficacy and Work Readiness of PAP FKIP UNS Students."

## Research Method

This research was conducted at the Office Administration Education Study Program, FKIP UNS, involving students from Class 2021. We used a quantitative causal approach, chosen to determine influence or causal relationships between independent variables and dependent variables. The dependent variable in this study was work readiness, while independent variables were office administration internships and self-efficacy. The population consisted of 80 students from the Office Administration Education Study Program at FKIP UNS from the 2021 cohort who had completed office administration internships. Data processing and analysis were conducted using SPSS Statistics 25 software. We employed non-probability sampling with saturated sampling method. Non-probability sampling is a technique for selecting samples that does not give equal opportunity to every population member to be selected as a sample. In determining samples, specific criteria set by researchers are required.

Data collection techniques were carried out using closed instruments with answer options ranging from 1 to 4, with alternative answers ranging from strongly agree to strongly disagree. The use of a modified 1-4 Likert scale in this study aimed to minimize neutral answers, so that neutral answer options were not used in this instrument. Two tests were conducted: prerequisite analysis test, which included tests of normality, linearity, and multicollinearity; and hypothesis test, which included t-tests, F-tests, multiple linear regression analysis, determination coefficients, and calculations of effective and relative contributions.

Instrument development in this study was based on variables and then referred to indicators used by researchers. Each indicator was described with operational definition, which could then be derived into statements. Research instruments had to be tested first before being filled out by research samples. Testing was necessary to ensure that research instruments were valid and reliable so that accurate and trustworthy data could be obtained. In this study, validity and reliability tests were conducted through trials involving 20 students from the Office Administration Education Study Program, FKIP UNS, Class of 2020. We selected students from the Office Administration Education Study Program, FKIP UNS, Class of 2020 as research instrument trial group because they were students who had passed the MBKM office administration internship course. From validity tests of the three variables, we obtained the following results: for work readiness variable, 13 statements were valid and 2 were invalid; for office administration internship variable, all 10 statements were valid; for self-efficacy variable, 8 statements were valid. Next, reliability tests were conducted for each variable, yielding the following reliability values: 0.803 for work readiness ($> 0.60$); 0.695 for office administration internship ($> 0.60$); and 0.659 for self-efficacy ($> 0.60$). Based on these results, we concluded that research instruments used were valid and reliable.

## Results and Discussion

### Research Results

Based on descriptive data analysis, the job readiness variable showed a minimum value of 26, a maximum value of 51, and a mean of 35.80. The total score for job readiness variable based on collected data was 2,864, consisting of 13 statements. Meanwhile, the office administration internship variable had a minimum value of 23, a maximum value of 36, and a mean of 29.71. The total score for office administration internship variable based on collected data was 2,377, and this variable consisted of 10 statements. Furthermore, the self-efficacy variable had a minimum value of 15, a maximum value of 32, and a mean of 22.46. The total score for self-efficacy variable based on collected data was 1,797, and this variable consisted of 8 statements.

Prerequisite tests used in this study included normality, linearity, and multicollinearity tests. Normality test results showed an Asymp. Sig (2-tailed) value of $0.200 > 0.05$, indicating that data

in this study were normally distributed. Linearity test between office administration internship ($X_1$) and work readiness (Y) showed a Deviation from Linearity value of $0.694 > 0.05$, meaning that office administration internship and work readiness had a linear relationship. Similarly, linearity test between self-efficacy ($X_2$) and work readiness (Y) showed a Deviation from Linearity value of $0.142 > 0.05$, meaning that self-efficacy and work readiness also had a linear relationship. Multicollinearity test results showed a Tolerance value for independent variables of $0.860 > 0.10$ and a VIF value of $1.163 < 10$. Based on these results, we concluded that there was no multicollinearity issue in independent variables.

The t-test in this study was conducted to determine effects of independent variables on dependent variables individually or partially. Table 1 presents the t-test results:

**Table 1**
*Partial Significance Test Results (t-test)*

| Model | T test | Sig |
|---|---|---|
| *(Constant)* | 2.233 | 0.028 |
| *Internship* | 2.768 | 0.007 |
| *Self Efficacy* | 6.609 | 0.000 |

(Source: Data processed by researchers, 2025)

The t-test results in Table 1 show that office administration internship variable ($X_1$) with work readiness (Y) obtained a t-value of $2.768 >$ ttable 1.990 and a significance value of $0.007 < 0.05$. The tcalculated value was obtained using the formula $\alpha = 0.05$ with df 77 (n - k - 1 = 80 - 2 - 1). We concluded that $H_0$ was rejected and $H_1$ was accepted, meaning that there was a significant partial effect of office administration internship variable ($X_1$) on work readiness (Y). Furthermore, t-test results for self-efficacy variable ($X_2$) on work readiness (Y) showed that self-efficacy variable obtained a t-value of $6.609 >$ ttable 1.990 and a significance value of $0.000 < 0.05$. The t-calculated value was obtained from the formula $\alpha = 0.05$ with df 77 (n - k - 1 = 80 - 2 - 1). We concluded that $H_0$ was rejected and $H_1$ was accepted, meaning that there was a significant influence of self-efficacy variable ($X_2$) on work readiness (Y) partially.

The F-test in this study aimed to determine whether there was simultaneous or concurrent effect of independent variables on dependent variables. Table 2 presents the F-test results:

**Table 2**
*Simultaneous Significance Test Results (F Test)*

| Model | Sum of Squares | df | Mean Square | F | Sig |
|---|---|---|---|---|---|
| Regression | 704.004 | 2 | 352.002 | 37.813 | 0.000 |
| Residual | 716.796 | 77 | 9.309 | | |
| *Total* | *1420.800* | *79* | | | |

(Source: Data processed by researchers, 2025)

Based on Table 2, the significance value was $0.000 < 0.05$ and Fcount was $37.813 >$ Ftable 3.11. The Ftable value was obtained based on $\alpha = 0.05$ with df 78 (n - k = 80 - 2). From comparison of significance value and Fhitung value, we concluded that there was significant influence between office administration internship variables ($X_1$) and self-efficacy ($X_2$) simultaneously.

**Table 3**
*Multiple Linear Analysis Results*

| Model | B | Std. Eror | Beta |
|---|---|---|---|
| *Constant* | 7.995 | 3.580 | |
| *Internship* | .329 | .119 | .242 |
| *Self Efficacy* | .803 | .121 | .577 |

(Source: Data processed by researchers, 2025)

Based on Table 3, we obtained the following regression equation:
$$\hat{Y} = 7.995 + 0.329X_1 + 0.803X_2$$
The explanation of the regression equation in Table 3 is as follows: (1) The constant value of 7.995 is positive, indicating that if values of office administration internship variable $(X_1)$ and self-efficacy $(X_2)$ equal 0, then the value of $\hat{Y}$ is 7.995; (2) The coefficient value of $(X_1)$ is 0.329, which is positive, indicating that office administration internship variable has positive influence on work readiness of students in the Office Administration Education Program at FKIP UNS, Class of 2021. If there is a 1% increase in office administration internship variable $(X_1)$, it will increase work readiness (Y) by 0.329, assuming other variables remain constant; (3) The coefficient value of self-efficacy $(X_2)$ is 0.803, which is positive, indicating that self-efficacy variable has positive influence on work readiness of students in the Office Administration Education Program at FKIP UNS, Class of 2021. If there is a 1% increase in self-efficacy variable $(X_2)$, it will increase work readiness (Y) by 0.803, assuming other variables remain constant.

**Table 4**
*Results of the Coefficient of Determination Test*

| R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|
| .704[a] | .495 | .482 | 3.051 |

(Source: Data processed by researchers, 2025)

The analysis of determination coefficient in Table 4 aimed to determine the percentage of influence of office administration internship and self-efficacy variables on work readiness. Based on results obtained in Table 4, the coefficient of determination $(R^2)$ value was 0.495. This indicates that office administration internship and self-efficacy variables had influence on work readiness variable of 49.5%, while the remaining 50.5% was influenced by other factors not investigated in this study.

**Discussion**

The first hypothesis in this study stated that there was positive and significant effect of office administration internships on work readiness of PAP FKIP UNS students from the 2021 cohort. This hypothesis was accepted and proven by calculation results of tcount > ttable (2.768 > 1.990) and had a significance value of 0.007 < 0.05. Based on these results, H₀ was rejected, meaning there was significant influence between office administration internship variable and work readiness variable of students in the Office Administration Education Program at FKIP UNS, Class of 2021, in a partial manner. Good internship programs will enhance students' work readiness for entering workforces. Individuals with internship experience are more likely to have higher work readiness compared to those without internship experience. These results align with previous research conducted by Azizah, Santoso, and Sumaryati (2019), which showed that internship experience had positive and significant effects on students' work readiness. Similarly, research by Suyanto et al. (2019) shows that there was positive and significant influence between administrative internship experience and students' work readiness.

Office administration internships can serve as stepping stones for students to enter workforces. Through internship activities, students can develop good work habits, skills, and attitudes, which are essential preparations for entering workforces in their respective fields (Lee et al., 2012). Administration internships are forms of self-preparation undertaken by students to enhance their competence as administrators and to become professionals in working directly in fields. Good internship programs enhance students' readiness for workforces. Individuals with internship experience are more likely to have higher job readiness compared to those without such experience. This indicates that one of the factors driving students' job readiness is internship activity.

The second hypothesis of this study stated that there was positive and significant effect of self-efficacy on work readiness of PAP FKIP UNS 2021 students. This hypothesis was accepted and proven by calculation results of tcount > ttable (6.609 > 1.990) and had a significance value of 0.000 < 0.05. Based on these results, H₀ was rejected, meaning that there was significant influence between

self-efficacy variable and work readiness variable of students in the Office Administration Education Program at FKIP UNS, Class of 2021, in a partial manner. These results are consistent with previous research conducted by Podungge (2023), who found that self-efficacy variable had positive effects on students' work readiness, and are supported by research conducted by Wiharja MS et al. (2020) on effects of self-efficacy on work readiness of vocational education students.

Self-efficacy is a measure of how much individuals believe in their ability to complete particular tasks or jobs. Damayantie and Kustini (2022) state that self-efficacy is the basis for individuals to do everything and is the most important part of individuals' personality related to work readiness. Individuals' work readiness is influenced by their beliefs about career preparation, as self-efficacy reflects learning processes undertaken by individuals and behavioral changes that enhance work readiness (Haq & Adiwati, 2024). When entering workforces, strong mindsets are essential, and individuals with high self-efficacy are better equipped to compete with others. This aligns with self-efficacy theory, also known as social cognitive theory, which relates to individuals' levels of confidence or belief in performing tasks. The higher individuals' self-efficacy, the more it enhances their self-confidence in their ability to succeed (Wiharja MS et al., 2020). We concluded that self-efficacy influences work readiness.

Furthermore, the third hypothesis of this study stated that there was positive and significant influence of office administration internships and self-efficacy together on work readiness of students in the Office Administration Education Study Program, FKIP UNS, Class of 2021. This hypothesis was accepted and proven by F-test calculation results, which showed that significance value was $0.000 < 0.05$, while comparison between calculated F-value and table F-value yielded a value of $37.813 > 3.11$. Based on comparison of significance value and Fcount, we concluded that $H_0$ was rejected, meaning there was positive and significant influence between office administration internship and self-efficacy variables together on work readiness of students in the Office Administration Education Program at FKIP UNS 2021. These results are consistent with research conducted by Dwiki and Hesty (2024), which showed that self-efficacy and internship experience played important roles in enhancing students' work readiness.

Several factors can influence students' readiness to enter workforces, including internships and self-efficacy. Internships can help students become more prepared for work, as they provide workplace understanding and practical skills and expertise, rather than just theory learned in lectures. In addition to internships, self-efficacy is also a crucial factor, as high self-efficacy enables students to feel more confident and assured of their ability to compete in workplaces.

## Conclusion

Based on research results, we concluded that: (1) there was positive and significant effect of office administration internships on work readiness of students in the Office Administration Education Study Program at FKIP UNS Class of 2021; (2) there was positive and significant effect of self-efficacy on work readiness of students in the Office Administration Education Study Program at FKIP UNS Class of 2021; (3) there was positive and significant influence of office administration internships and self-efficacy together on work readiness of students in the Office Administration Education Program at FKIP UNS, Class of 2021.

The recommendation given to program coordinators is to evaluate internship program implementation, particularly in office administration fields, establish collaborations with more institutions or companies to enhance office administration internship quality, monitor internship programs to ensure students gain maximum experience, and integrate self-efficacy development into curricula, such as conducting training focused on improving self-efficacy through public speaking, problem-solving, and decision-making skills. Recommendations for other students are to enhance their sense of courage, critical thinking, and initiative; improve communication skills; develop positive mindsets by utilizing both on-campus and off-campus programs such as competitions, internships, or organizational activities to hone their abilities; enhance skills; and expand networks to boost their confidence in facing workplace challenges after graduation. Additionally, future researchers are encouraged to expand research populations and sample sizes to obtain more

comprehensive results and consider using different research methods to gain deeper insights into factors influencing students' work readiness.

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# Effects of organizational experience and emotional intelligence on public speaking skills

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***Abstrak***

*Penelitian ini bertujuan untuk mengetahui: (1) pengaruh pengalaman organisasi terhadap kemampuan public speaking. (2) pengaruh kecerdasan emosional terhadap kemampuan public speaking, (3) pengaruh pengalaman organisasi dan kecerdasan emosional terhadap kemampuan public speaking. Penelitian ini merupakan penelitian kuantitatif dengan desain asosiatif kausal. Sumber data yang digunakan yaitu data primer. Populasi dalam penelitian ini yakni 109 orang. Teknik pengambilan sampel dilakukan dengan stratified random sampling yaitu sampling strata. Pengumpulan data dilakukan dengan penyebaran angket kuesioner. Teknik analisis data yang digunakan yaitu regresi logistik multinomial. Hasil penelitian menunjukan bahwa: (1) terdapat pengaruh yang signifikan pengalaman organisasi terhadap kemampuan public speaking (sign 0,000), (2) terdapat pengaruh secara simultan kecerdasan emosional terhadap kemampuan public speaking (sign 0,003), dan (3) terdapat pengaruh yang signifikan antara pengalaman organisasi dan kecerdasan emosional terhadap kemampuan public speaking (sign 0,000). Koefisien determinasi R Square sebesar 0,407 yang berarti bahwa 40,7% kemampuan public speaking (Y) dipengaruhi oleh variabel pengalaman organisasi (X1), dan sisanya sebanyak 59,3% dipengaruhi oleh variabel lain diluar penelitian.*

*Kata kunci: keaktifan berorganisasi; kemampuan berbicara; mengelola emosi*

**Abstract**

This study examined: (1) the influence of organizational experience on public speaking skills, (2) the influence of emotional intelligence on public speaking skills, and (3) the combined influence of organizational experience and emotional intelligence on public speaking skills. We employed a quantitative approach with causal associative design using primary data. The population consisted of 109 individuals, with stratified random sampling used for sample selection. Data were collected through questionnaire surveys and analyzed using multinomial logistic regression. Results indicated that: (1) organizational experience had a significant influence on public speaking skills ($p < .001$), (2) emotional intelligence had a significant influence on public speaking skills ($p = .003$), and (3) organizational

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experience and emotional intelligence together had a significant influence on public speaking skills ($p < .001$). The coefficient of determination ($R^2$) was 0.407, indicating that 40.7% of public speaking skills variance was explained by organizational experience and emotional intelligence variables, while the remaining 59.3% was influenced by other variables not examined in this study.

## Introduction

Public speaking represents an individual's ability to speak in public correctly so that messages can be clearly conveyed and goals can be achieved effectively (Dunar, 2015). Public speaking can make people better because it helps them connect with their authentic selves (Hale, 2010). Public speaking can also be interpreted as oral communication, whether conducted face-to-face with the public or with specific groups of people (Jannah et al., 2022). Public speaking can earn appreciation from colleagues, friends, relatives, or other public speakers. Being a confident public speaker can earn the admiration and respect of others (Davidson, 2003).

Public speaking is a crucial skill increasingly needed in various life contexts, including academic, professional, and social settings. Public speaking involves more than verbal communication; it also encompasses managing nonverbal aspects such as intonation, gestures, and eye contact. This skill helps individuals convey information, build social relationships, and foster confidence when interacting with audiences. For students, public speaking skills are vital for supporting academic presentations, leadership within organizations, and preparing for the workplace (Hadi & Dewi, 2024).

However, reality shows that many students still experience obstacles in public speaking. Public speaking often becomes a source of anxiety, especially for students unaccustomed to performing in public (Puspitasari, 2023). Furthermore, limited practice time and lack of opportunities to develop ideas verbally in class make public speaking less than optimal (Rahmayanti et al., 2023). Students often pay insufficient attention to nonverbal communication, which is crucial for supporting message effectiveness (Oktavianti & Rusdi, 2019).

This problem also occurs among students in the Office Administration Education Study Program (PAP Study Program), Faculty of Teacher Training and Education, Sebelas Maret University. Based on preliminary study findings, most students still rarely demonstrate self-confidence, rarely control nervousness, and lack fluency and courage to speak in public. Specifically, 61.9% of students rarely have confidence, 71.4% rarely control nervousness, 57.1% rarely dare to speak, and 76.2% rarely fluently express opinions in public forums.

Various factors are thought to influence students' public speaking abilities, both internally and externally. Internal factors include self-confidence, material mastery, communication skills, and emotional intelligence (Zahara, 2018). Meanwhile, external factors include audience environment, organizational experience, and physical and mental state during speaking (Darmayanti et al., 2022). Based on preliminary study, two dominant factors are suspected to influence PAP students' public speaking skills at the Faculty of Teacher Training and Education, Sebelas Maret University (UNS): organizational experience and emotional intelligence. Data show that 65.7% of students associate public speaking skills with emotional intelligence, while 57.1% associate it with organizational experience.

Organizational experience is known to contribute significantly to communication and leadership skill development. Student participation in student organizations provides means of practicing public speaking through discussions, presentations, and group problem-solving (Suranto

& Rusdianti, 2018). Furthermore, emotional intelligence enables individuals to manage stress, understand their own and others' emotions, and foster effective interactions, all of which are crucial in public speaking contexts (Thaib, 2013; Wijayanti et al., 2021).

Based on this background, this study aimed to examine the influence of organizational experience and emotional intelligence on public speaking skills of students in the Office Administration Education Study Program, Faculty of Teacher Training and Education, Sebelas Maret University. This study is expected to contribute to formulating student development strategies, particularly in improving their communication competencies as provisions for facing work environments that demand effective presentation and communication abilities.

## Research Methods

This research was conducted over four months, from December 2024 to March 2025. The research process was divided into four stages: preparation, implementation, reporting, and examination. Each stage was implemented systematically to ensure that all research activities could run effectively and efficiently according to the established schedule.

This research used a quantitative approach. According to Sugiyono (2010), the quantitative method is a research design based on positivism philosophy, used to study specific populations or samples, with data collection through research instruments and statistical data analysis. The purpose of this method is to describe and test predetermined hypotheses. This study examined the influence of two independent variables: organizational experience ($X_1$) and emotional intelligence ($X_2$) on the dependent variable: public speaking ability (Y).

The population consisted of 151 students from the Office Administration Education Study Program (PAP) FKIP Sebelas Maret University, batches 2021-2023, who had organizational experience. Sampling was conducted using the Slovin formula with a 5% error rate, resulting in a total sample of 109 students. The sampling technique used was stratified random sampling, as the population had a stratified structure based on batch. Sample size for each batch was determined proportionally, with 45 students from batch 2021, 41 students from batch 2022, and 23 students from batch 2023.

Data analysis began with data tabulation, followed by converting ordinal data to interval data using the Successive Interval method. This method was chosen because of its ability to convert ordinal data into interval data while maintaining the ordinal nature of original data (Herdianzah et al., 2024). The Successive Interval Method is based on the assumption that categories on ordinal scales can be converted into equal intervals using statistical calculations.

Next, prerequisite analysis tests were conducted, including normality tests using the Kolmogorov-Smirnov method, linearity tests using ANOVA tables, and multicollinearity tests through Tolerance and VIF values. The Kolmogorov-Smirnov test was chosen because of its suitability for large sample sizes (> 50) and its sensitivity to deviations from normal distribution. The 5% error rate was chosen as a good compromise between precision and sample size, so that required sample size was not too large but could still produce accurate estimates. After meeting requirements, analysis continued with hypothesis tests consisting of partial tests (t-tests), simultaneous tests (F-tests), and multiple linear regression analysis to determine simultaneous and partial effects of variable X on Y. The coefficient of determination test was used to assess the magnitude of combined effects of variable X on Y. Additionally, effective contribution and relative contribution of each independent variable to the dependent variable were calculated.

Data collection techniques are methods used by researchers to obtain information or research data and are strategic steps in research methodology (Daruhadi & Sopiati, 2024). The data collection technique used was closed-ended questionnaires designed based on indicators for each variable. The research instrument used a Likert scale with five assessment categories ranging from "Strongly Disagree" to "Strongly Agree." A questionnaire is an instrument used to collect data through a series of questions specifically designed to measure study variables (Ardiansyah et al., 2023). This scale is considered appropriate because it can measure respondents' attitudes, opinions, and perceptions. Instrument validity and reliability were tested using IBM SPSS software version 26. Validity tests

were conducted by comparing calculated and table r values, while reliability tests used Cronbach's Alpha values, with values ≥ 0.70 indicating reliable instruments.

## Results and Discussion

Based on descriptive data analysis, the organizational experience variable showed a minimum value of 18, a maximum value of 48, a mean value of 35.77, and a standard deviation of 6.298. The total score for organizational experience variable based on collected data was 3,899. This variable consisted of 11 statements, with measurements using a Likert scale from 1 to 5.

Meanwhile, the emotional intelligence variable had a minimum score of 17, a maximum score of 35, a mean score of 26.98, and a standard deviation of 4.076. The total score for emotional intelligence variable based on collected data was 2,940, also consisting of 8 statements.

Furthermore, the public speaking ability variable had a minimum value of 22, a maximum value of 54, a mean value of 38.15, and a standard deviation of 7.350. The total score for public speaking ability variable based on collected data was 4,243, also consisting of 12 statements.

Prerequisite tests used in this study included normality, linearity, multicollinearity, and heteroscedasticity tests. Normality test results showed that the Asymp. Sig. (2-tailed) value was 0.200 > 0.050, indicating that data in this study were normally distributed.

Linearity tests between organizational experience ($X_1$) and public speaking ability (Y) showed a Deviation from Linearity value of 0.834 > 0.050, so it could be concluded that organizational experience and public speaking ability had a linear relationship. Similarly, linearity tests between emotional intelligence ($X_2$) and public speaking ability (Y) showed a Deviation from Linearity value of 0.603 > 0.050, which also showed that emotional intelligence and public speaking ability had a linear relationship.

Multicollinearity test results showed that Tolerance values for independent variables were 0.681 > 0.10, and VIF values were 1.469 < 10. Based on these results, it could be concluded that there were no multicollinearity problems among independent variables.

**Table 1**
*T-Test Results*

| Model | T count | Sig. |
|---|---|---|
| (Constant) | 1,741 | ,085 |
| Organizational experience | 4,997 | ,000 |
| Emotional Intelligence | 3,084 | ,003 |

Source: Data processed by researchers (2025)

Based on Table 1, t-tests were conducted to determine the influence of each (partial) independent variable on the dependent variable. Based on t-test results between organizational experience ($X_1$) and public speaking ability (Y) in the table above, the organizational experience variable obtained a calculated t-value of 4.997 > ttable 1.982 and a significance value of 0.00 < 0.050. From the results of calculated t > ttable and significance value < 0.05, $H_0$ was rejected and $H_1$ was accepted, meaning there was significant influence of organizational experience variable ($X_1$) on public speaking ability (Y).

Furthermore, t-test results between emotional intelligence variable ($X_2$) and public speaking ability (Y) showed that emotional intelligence variable obtained a calculated t-value of 3.084 > ttable 1.982 and a significance value of 0.003 < 0.050. From the results of calculated t > ttable and significance value < 0.05, $H_0$ was rejected and $H_2$ was accepted, meaning there was significant influence of emotional intelligence variable ($X_2$) on public speaking ability (Y).

**Table 2**
*F Test Results*

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 2441.54 | 2 | 1220.77 | 38.13 | ,000 |
| Residual | 3393.27 | 106 | 32.01 | | |
| Total | 5834.81 | 108 | | | |

Source: Data processed by researchers (2025)

Based on Table 2, F-tests in this study were conducted to determine simultaneous or joint influence of independent variables on dependent variables. F-test results in the table above showed a significance value of $0.00 < 0.05$ and a calculated F-value of $38.13 > $ Ftable $3.97$. Based on these results, it could be concluded that $H_0$ was rejected, meaning there was significant influence simultaneously or jointly from organizational experience ($X_1$) and emotional intelligence ($X_2$) variables on public speaking ability (Y).

**Table 3**
*Multiple Linear Analysis Results*

| Model | B | Std. Error | Beta |
|---|---|---|---|
| (Constant) | 6,725 | 3,862 | |
| Organizational experience | 0.524 | 0.105 | 0.449 |
| Emotional Intelligence | 0.499 | 0.162 | 0.277 |

Source: Data processed by researchers (2025)

Based on Table 3, the regression equation obtained in this study was:
$$\hat{Y} = 6.725 + 0.524X_1 + 0.499X_2$$
Based on Table 3, the following can be explained: (1) The constant value of 6.725 is positive, indicating that if values of organizational experience variable ($X_1$) and emotional intelligence variable ($X_2$) equal 0, then the $\hat{Y}$ value will be 6.725; (2) The coefficient value of $X_1$ is 0.524, which is positive, indicating that organizational experience variable has positive influence on public speaking skills in the Office Administration Education Study Program, FKIP UNS, Classes of 2021, 2022, 2023. If there is a 1-point increase in organizational experience variable, it will increase public speaking ability by 0.524, assuming other variables remain constant; (3) The coefficient value of $X_2$ is 0.499, which is positive, indicating that emotional intelligence variable has positive influence on public speaking skills in the Office Administration Education Study Program, FKIP UNS, Classes of 2021, 2022, 2023. If there is a 1-point increase in emotional intelligence variable, it will increase public speaking ability by 0.499, assuming other variables remain constant.

**Table 4**
*Results of the Determination Coefficient Analysis*

| R | R Square | Adjusted R Square | Standard Error of the Estimate |
|---|---|---|---|
| ,647 | ,418 | ,407 | 5,628 |

Source: Data processed by researchers (2025)

The coefficient of determination analysis in Table 4 aimed to determine the extent to which organizational experience and emotional intelligence variables influence public speaking ability variable. Based on results presented in the table above, the coefficient of determination (Adjusted $R^2$) was 0.407. This indicates that organizational experience and emotional intelligence variables

influence public speaking ability variable by up to 40.7%. The remaining 59.3% is influenced by other factors or variables not examined in this study.

## The Influence of Organizational Experience on the Public Speaking Skills of PAP FKIP UNS Students

The first hypothesis stated that there was an influence of organizational experience on public speaking ability. The t-test results showed a t-count value of 4.997 with a significance of < .001, meaning t-count > t-table (4.997 > 1.982) and significance < 0.050. Thus, $H_0$ was rejected and $H_a$ was accepted, indicating positive and significant influence between organizational experience ($X_1$) on public speaking ability (Y). The regression coefficient of 0.524 indicates that every one-unit increase in variable $X_1$ will increase Y by 0.524, with an effective contribution of 27% and a relative contribution of 65.85%.

Organizational experience provides opportunities for individuals to hone their speaking skills through activities such as presentations, discussions, and leadership. Students who are active in organizations tend to have better self-confidence and communication skills. Conversely, lack of organizational experience can hinder public speaking skill development, resulting in low self-confidence and communication effectiveness, both in formal and informal situations. These results align with research conducted by Usera (2023), who stated that by participating in organizations, students can learn to recognize their audience characteristics and adapt their messages and communication styles according to situational contexts. This is supported by research by Darmayani et al. (2022), which found that organizational experience significantly influences public speaking skills.

From questionnaire results with 109 respondents, the statement with the highest score was "I actively contribute to group discussions or organizational meetings" (score 4.847), indicating that active involvement increases confidence in speaking. Conversely, the lowest score was for the statement "I encourage other members to share ideas" (score 2.082), indicating continued difficulty in expressing opinions. These results align with findings of Usera (2023) and Darmayani et al. (2022) that organizational experience significantly influences public speaking skills.

## Emotional Intelligence Influences Public Speaking Skills of PAP FKIP UNS Students

The second hypothesis stated that there was an influence of emotional intelligence on public speaking ability of PAP FKIP UNS students. The t-test results showed a t-value of 3.084 with a significance of 0.003, greater than t-table (1.982) and smaller than 0.050. Thus, $H_0$ was rejected and $H_a$ was accepted, meaning there was positive and significant influence between emotional intelligence ($X_2$) on public speaking ability (Y). The regression coefficient of 0.499 indicates that an increase in one unit of emotional intelligence will increase public speaking ability by 0.499, with an effective contribution of 14% and a relative contribution of 34.15%.

Emotional intelligence plays a crucial role in supporting public speaking skills because it helps individuals manage emotions, avoid stress, and remain calm when speaking in public. Students who are able to understand and control their feelings tend to be more confident and effective in conveying their messages. Emotional intelligence encompasses self-awareness, self-control, empathy, motivation, and social skills, all of which are highly relevant in public communication contexts. According to Goleman (2000), emotional intelligence can help someone adapt socially and improve communication skills. Students with high emotional intelligence tend to be more confident, able to control their emotions during presentations, and demonstrate good public speaking skills. In this study, the effect of emotional intelligence on public speaking ability was 14%.

Based on questionnaire data from 109 respondents, the item with the highest score was the statement "I am aware of my strengths and weaknesses" (score 4.529), indicating high self-awareness among the majority of students. Meanwhile, the lowest score was found in the statement "I am able to respect the opinions of others even though they differ" (score 2.180), which indicates challenges in empathy and tolerance aspects. These results support opinions of Kolopaking (2018) and Goleman (2000) that emotional intelligence is very influential in improving public speaking

skills, especially in managing anxiety and building emotional connections with audiences.

### Organizational Experience and Emotional Intelligence Jointly Influence the Public Speaking Skills of PAP FKIP UNS Students

The third hypothesis stated that there was simultaneous influence between organizational experience and emotional intelligence on public speaking ability of PAP FKIP UNS students. The F-test results showed Fcount of 38.13 > Ftable 3.08 with a significance of 0.000 (< 0.050), so $H_0$ was rejected and $H_a$ was accepted. This means that simultaneously there was positive and significant influence between organizational experience ($X_1$) and emotional intelligence ($X_2$) variables on public speaking ability (Y). This shows that both independent variables together are able to explain variations in students' public speaking ability.

The coefficient of determination ($R^2$) of 0.407 indicates that 40.7% of public speaking ability is influenced by organizational experience and emotional intelligence, while the remaining 59.3% is influenced by other factors outside this study. This finding strengthens the conclusion that the higher the level of organizational experience and emotional intelligence of students, the better their public speaking ability. Conversely, if organizational experience is minimal and emotional intelligence is low, public speaking ability tends to be weaker.

Questionnaire results showed that the item with the highest score was the statement "I have the ability to speak in front of a crowd" (score 3.581), reflecting some students' confidence in their abilities. However, the lowest score was for the statement "I am able to convey information clearly" (score 1.000), indicating that students still experience self-doubt or communication barriers. This could be caused by lack of intense organizational experience and less than optimal emotional management when engaging in public speaking.

## Conclusion

Based on research results, we concluded that there was positive and significant influence between organizational experience and public speaking ability, as evidenced by tcount > ttable (4.997 > 1.982) and significance of 0.000 < 0.050, so that $H_0$ was rejected and $H_a$ was accepted. Additionally, emotional intelligence also had positive and significant influence on public speaking ability, as evidenced by tcount > ttable (3.084 > 1.982) and significance of 0.003 < 0.050. Simultaneously, organizational experience and emotional intelligence also had positive and significant influence on public speaking ability, as indicated by the value of Fcount > Ftable (38.13 > 3.08) and significance of 0.000 < 0.050. The Adjusted $R^2$ value of 0.407 indicated that 40.7% of variation in public speaking ability could be explained by the two independent variables, while the remaining 59.3% was influenced by other factors outside this study. The effective contribution of organizational experience to public speaking ability was 27% and emotional intelligence was 14%, while the relative contribution of organizational experience was 65.85% and emotional intelligence was 34.15%. This study still has limitations that can be used as evaluation material for further research and suggestions for future researchers. Considering other variables suspected to influence public speaking skills in students can add to the theoretical repertoire related to public speaking skills because research results show that organizational experience and emotional intelligence variables together have influence on public speaking skills by 41.8%. Thus, there are 58.2% of other variables that can influence public speaking skills.

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# Effects of self-regulation and family environment on students' learning discipline

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### *Abstrak*

*Penelitian ini bertujuan untuk mengkaji pengaruh regulasi diri dan lingkungan keluarga terhadap kedisiplinan belajar siswa kelas X MPLB SMK Negeri 6 Surakarta baik secara simultan maupun parsial. Pendekatan yang digunakan adalah kuantitatif kausalitas dengan metode ex post facto. Populasi penelitian berjumlah 108 siswa, dan yang dijadikan sampel adalah 86 siswa. Data dikumpulkan melalui angket skala Likert yang telah teruji validitas dan reliabilitas, dan dianalisis menggunakan regresi linier berganda dengan perangkat lunak IBM SPSS Statistics 27. Hasil analisis menunjukkan: (1) regulasi diri berpengaruh positif dan signifikan terhadap kedisiplinan belajar, dengan t-hitung = 5,77 > t-tabel = 1,98 dan p = 0,001 < 0,05; (2) lingkungan keluarga tidak berpengaruh signifikan terhadap kedisiplinan belajar, dengan t-hitung = 1,07 < t-tabel = 1,98 dan p = 0,31 < 0,05; dan (3) secara simultan regulasi diri dan lingkungan keluarga berpengaruh positif dan signifikan, dengan F-hitung = 19,19 > F-tabel = 3,11 dan p = 0,001 < 0,05. Persamaan regresi yang dihasilkan adalah $\hat{Y} = 19,79 + 0,44 X_1 + 0,04 X_2$, dengan koefisien determinasi ($R^2$) sebesar 0,312, yang berarti kedua variabel independen bersama-sama menjelaskan 31,2% varians kedisiplinan belajar siswa.*

*Kata kunci: kuantitatif; regresi berganda; sekolah menengah kejuruan*

### Abstract

This study aimed to examine the influence of self-regulation and family environment on learning discipline among Grade X Office Administration and Business Services (OABS) students at SMK Negeri 6 Surakarta, both simultaneously and individually. Methods: A quantitative causal approach with ex post facto design was employed. The population comprised 108 students, with 86 selected as the sample using simple random sampling. Data were collected through validated and reliable Likert-scale questionnaires and analyzed using multiple linear regression with IBM SPSS Statistics 27. Results: The analysis revealed that: (1) self-regulation demonstrated a positive and significant effect on learning discipline (t = 5.77 > t-table = 1.98, p = 0.001 < 0.05); (2) family environment showed no significant effect on learning discipline (t = 1.07 < t-table = 1.98, p = 0.31 > 0.05); and (3) simultaneously, self-regulation and family

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environment exhibited a positive and significant influence (F = 19.19 > F-table = 3.11, p = 0.001 < 0.05). Conclusion: The regression equation $Y = 19.79 + 0.44X_1 + 0.04X_2$ was derived, with a coefficient of determination ($R^2$) of 0.312, indicating that both independent variables together explained 31.2% of the variance in students' learning discipline. Self-regulation emerged as the primary predictor of learning discipline in vocational education settings.

## Introduction

Education represents a fundamental pillar in developing quality human resources. At the secondary education level, student learning discipline emerges as a crucial factor influencing academic success. According to Wahab et al. (2021), learning discipline constitutes a key factor in student academic achievement. Heryanti et al. (2022) defined learning discipline as student behavior in maintaining order, regularity, and responsibility toward their learning processes. According to Ismail et al. (2023), students with learning discipline tend to be more capable of managing time, completing assignments punctually, and demonstrating superior academic performance. Discipline involves adherence to study schedules, timely task completion, and active classroom participation. In educational settings, this discipline serves as an essential prerequisite for achieving learning objectives. Disciplined students tend toward greater success because they can optimize study time, understand instructions, and demonstrate responsible attitudes (Khoeriyah, 2022). According to Saumadhani and Surjanti (2021), learning discipline plays an important role in facilitating educational processes. Discipline is determined not only by school environment but also by internal and external factors involving students, such as self-regulation and family environment. Therefore, understanding the interaction between these factors regarding student learning discipline becomes crucial.

Self-regulation represents an individual's ability to control behavior, thoughts, and emotions to achieve learning objectives. In educational contexts, self-regulation involves planning, monitoring, and evaluating learning processes undertaken by students. According to Baeng et al. (2020), students capable of self-regulation tend to be more consistent and disciplined in learning. Students with effective self-regulation can create efficient study schedules, commit to their academic goals, and better overcome obstacles emerging during learning processes. With strong self-regulation, students can more easily focus attention, avoid distractions, and persist when facing learning difficulties (Friskilia & Winata, 2018). Students with positive self-concepts tend to behave according to their surrounding environment and follow learning discipline established by schools (Reski et al., 2017).

Conversely, family environment also plays an important role in learning discipline. Family represents the first environment where children learn about values such as discipline, responsibility, and motivation. According to Khoeriyah (2022), family support encompassing attention, supervision, and encouragement significantly influences student learning discipline levels. Families providing positive learning environments can enhance student motivation and discipline, while unsupportive families may cause diminished learning enthusiasm. Parents who actively monitor their children's learning development, provide positive encouragement, and create conducive learning atmospheres tend to have children who are disciplined in learning. Conversely, unsupportive family environments, such as lack of parental attention, indifference toward children's education, or unconducive home atmospheres, can impede children's learning processes and reduce their discipline levels.

Research by Baeng et al. (2020) demonstrated significant relationships between self-regulation and student learning discipline, where students capable of self-regulation were more disciplined in completing tasks, adhering to study schedules, and participating actively in class. This was supported by Khoeriyah (2022), who found that family environment support significantly enhanced student learning motivation and discipline, while students receiving inadequate family support showed irregular and undisciplined learning behaviors. However, although both studies addressed each factor separately, limited research specifically discusses how interactions between self-regulation and family environment factors influence student learning discipline at vocational education levels. Most existing research focuses more on general school students, thus failing to provide clear insights regarding learning discipline dynamics among vocational school students, particularly in Office Administration and Business Services (OABS) programs. Therefore, this study aims to fill this gap by examining self-regulation and family environment influences on OABS student learning discipline at SMK Negeri 6 Surakarta.

Grade X Office Administration and Business Services (OABS) students at SMK Negeri 6 Surakarta experience transitions from junior high to vocational schools, demanding higher learning discipline in following schedules, completing assignments, and participating actively in class. This discipline is important for building academic habits and skills supporting success in vocational education. However, preliminary observations by practicum teachers at SMK Negeri 6 Surakarta indicated that many students lacked discipline, frequently arriving late, failing to complete assignments punctually, and showing minimal learning participation. These conditions can impede expected competency achievement, necessitating further studies to understand factors influencing their learning discipline and improvement efforts. This was reinforced by research data from Fathurrizqy and Ulfatun (2024), showing that only 7 students actively participated from 36 total students, while others tended toward passivity. Some students merely sat quietly, used mobile devices, or listened to explanations without enthusiasm. Additionally, in implementing work culture at SMK Negeri 6 Surakarta, according to Santosa et al. (2021), several students failed to properly implement work culture at school, requiring teachers to provide warnings or sanctions to violating students. These conditions emphasize the need for greater attention to student learning discipline aspects, as this can contribute to academic success and student readiness for entering the workforce.

Based on the background above, previous research indicated that both self-regulation and family support have positive relationships with student learning discipline. However, studies integrating both variables in vocational education contexts remain limited. Therefore, this research was conducted to determine self-regulation and family environment influences on Grade X OABS student learning discipline at SMK Negeri 6 Surakarta.

## Research Methods

This research was conducted during the even semester of the 2024/2025 academic year and located at SMK Negeri 6 Surakarta, situated at Jl. Adi Sucipto No. 38, Kerten, Laweyan District, Surakarta City. School selection was based on strategic considerations as the researcher's School Field Introduction (PLP) activity location and possessing student characteristics suitable for research focus, namely student learning discipline behavior at Vocational High School (SMK) levels.

Grade X Office Administration and Business Services (OABS) students at this school were undergoing adjustment phases from junior high to vocational learning demanding greater independence and discipline. Preliminary observations revealed disciplinary problems such as tardiness, inadequate assignment completion, and low classroom participation. These conditions reflected common challenges also faced by SMK students generally, making SMK Negeri 6 Surakarta an appropriate location for examining self-regulation and family environment influences on learning discipline in vocational education contexts.

This research employed a quantitative approach with causal design and ex post facto methods, namely methods used to trace cause-and-effect relationships between variables without direct treatment or manipulation by researchers. This method was chosen because studied variables—self-regulation and family environment—represent natural variables that cannot be intervened. Thus, this method was deemed suitable for answering problem formulations regarding

both independent variable influences on student learning discipline, both partially and simultaneously.

The research population comprised all Grade X Office Administration and Business Services (OABS) Program students at SMK Negeri 6 Surakarta, totaling 108 students. Sample size determination referenced Krejcie and Morgan formulas with 5% error levels, obtaining 86 students as samples. The sampling technique employed simple random sampling using digital spinwheel tools, providing equal opportunities for every population member to be randomly selected.

Research instruments comprised closed questionnaires using four-level Likert scales: always, often, rarely, and never. Each variable was measured based on indicators compiled from relevant theories. Instruments underwent validity testing using Pearson Product Moment correlation formulas, showing all items were valid because r-calculated > r-table. Subsequently, reliability was tested using Cronbach's Alpha, with results showing all instruments had alpha values > 0.70, thus declared reliable.

Classical assumption tests ensured data met statistical assumptions. Normality tests used Kolmogorov-Smirnov, linearity tests used Test of Linearity, and multicollinearity tests examined Tolerance values and Variance Inflation Factor (VIF).

Data analysis employed multiple linear regression techniques to determine self-regulation and family environment variable influences on student learning discipline. Hypothesis testing procedures included: (1) t-test analysis to determine individual independent variable influences; (2) F-test to examine simultaneous variable influences; (3) significance value (p-value) interpretation with 0.05 references; (4) regression equation formulation to describe direction and magnitude of inter-variable influences; and (5) coefficient of determination ($R^2$) calculation to determine dependent variable variance proportions explainable by independent variables. All analytical processes used IBM SPSS Statistics version 27 software.

## Results and Discussion

### Results

Data description showed minimum scores for self-regulation variables were 24 and maximum scores were 40, with means of 32.31 and standard deviations (SD) of 3.76. This indicated that respondents generally tended toward self-regulation values around 32-33, although variations were shown by standard deviations of approximately 3.76 points from means. Meanwhile, minimum scores for family environment variables were 20 and maximum scores were 48, with means of 37.36 and standard deviations (SD) of 6.97. This indicated that respondents generally had family environment values around 37-38, although variations were shown by standard deviations of approximately 6.97 points from means.

Prerequisite analysis tests showed normally distributed data with Kolmogorov-Smirnov significance values of $0.200 > 0.05$, and linearity based on test of linearity results with self-regulation variables of $0.173 > 0.05$ and family environment variables of $0.316 > 0.05$. No multicollinearity symptoms were found because VIF values < 10 and Tolerance > 0.1.

As shown in Table 1, multiple linear regression analysis results revealed a regression equation: $Y = 19.790 + 0.449X_1 + 0.042X_2$. This equation can be interpreted as follows: (1) The constant value of 19.790 represents the state when learning discipline variables have not been influenced by other variables, namely self-regulation ($X_1$) and family environment ($X_2$) variables; (2) The $b_1$ value ($X_1$ regression coefficient) of 0.449 indicates that $X_1$ variables have positive influences on Y variables, meaning every one-unit increase in $X_1$ variables will influence Y by 0.449, assuming other variables are not examined in this research; (3) The $b_2$ value ($X_2$ regression coefficient) of 0.042 indicates that $X_2$ variables have positive influences on Y variables, meaning every one-unit increase in $X_2$ variables will influence Y by 0.042, assuming other variables are not examined in this research.

**Table 1**
*Multiple Linear Regression Analysis Results*

| Model | B | t | Sig. | F |
|---|---|---|---|---|
| (Constant) | 19.790 | 7.352 | .000 | 19.196 |
| Self-Regulation ($X_1$) | .449 | 5.775 | .000 | |
| Family Environment ($X_2$) | .042 | 1.007 | .317 | |

Source: Data processed by researchers (2025)

Table 1 also demonstrates that self-regulation ($X_1$) significance values toward learning discipline (Y) were $0.001 < 0.05$ and t-calculated values of $5.77 >$ t-table 1.98, indicating significant self-regulation influences on learning discipline. Family environment ($X_2$) significance values toward learning discipline (Y) were $0.317 > 0.05$ and t-calculated values of $1.07 <$ t-table 1.98, indicating no significant family environment influences on learning discipline.

Based on Table 1 calculations, significance values of $0.001 < 0.05$ and F-calculated values of $19.19 >$ F-table 3.11 were obtained, thus Ha was accepted and Ho was rejected. Therefore, it can be concluded that self-regulation and family environment influence learning discipline simultaneously.

As presented in Table 2, the coefficient of determination analysis revealed an $R^2$ value of 0.316, indicating that self-regulation and family environment variables contributed 31.6% to learning discipline. The remaining 68.4% represented contributions from other variable factors not examined in this research.

**Table 2**
*Coefficient of Determination*

| R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|
| .562[a] | .316 | .300 | 2.643 |

Source: Data processed by researchers (2025)

Effective contribution is used to measure contributions provided by each X variable toward Y variables. The sum of effective contributions from all independent variables equals R Square ($R^2$) values, as demonstrated in Table 3.

**Table 3**
*Effective Contribution Calculation Result*

| Variable | Value |
|---|---|
| Self-Regulation ($X_1$) | 0,536 x 0,555 x 100 = 29,748 |
| Family Environment ($X_2$) | 0,093 x 0,204 x 100 = 1,8972 |
| Total | 31,6452 |

Source: Data processed by researchers (2025)

Based on Table 3 above, the sum of effective contributions from all independent variables equals R Square ($R^2$) values.

**Table 4**
*Relative Contribution Calculation Result*

| Variiable | Value |
|---|---|
| Self-Regulation ($X_1$) | 29,748 x 31,645 x 100 = 94 |
| Family Environment ($X_2$) | 1,897 x 31,645 x 100 = 6 |
| Total | 100 |

(Sumber: Data pribadi yang diolah peneleti, 2025)

Based on Table 4 above, the sum of relative contributions (SR) from all independent variables equals 100% or 1.

## Discussion

### Effects of Self-Regulation on Learning Discipline of Grade X Office Administration and Business Services Students at SMK Negeri 6 Surakarta

Self-regulation demonstrated positive and significant effects on learning discipline among Grade X Office Administration and Business Services students at SMK Negeri 6 Surakarta. Higher motivation formed due to self-regulation will increase learning discipline among Grade X Office Administration and Business Services students at SMK Negeri 6 Surakarta. Conversely, lower motivation formed due to self-regulation will correspondingly decrease student learning discipline.

T-test results showed self-regulation significance values of 0.001, smaller than 0.05, and t-calculated values greater than t-table (5.77 > 1.98). Based on significance values less than 0.05 and t-calculated values greater than t-table, Ho was rejected, indicating significant partial influences between self-regulation variables and learning discipline variables among Grade X Office Administration and Business Services students at SMK Negeri 6 Surakarta.

These research findings align with discoveries by Baeng et al. (2020), demonstrating that students with high self-regulation levels showed better learning discipline, especially in managing time and academic responsibilities. Baeng et al. (2020) stated that self-regulation contributions to learning discipline reached 13%, meaning significant influences existed between self-regulation and learning discipline. Sumandari (2021), researching at SD Negeri 2 Gumul, Klaten, showed that self-regulation positively and significantly influenced student discipline with significance values of $0.000 < 0.05$ and coefficient of determination ($R^2$) of 58.8%. This meant self-regulation contributed 58.8% to student learning discipline.

### Effects of Family Environment on Learning Discipline

Family environment showed no significant effects on learning discipline among Grade X Office Administration and Business Services students at SMK Negeri 6 Surakarta. Better family environments will increase learning discipline among Grade X Office Administration and Business Services students at SMK Negeri 6 Surakarta. Conversely, poorer family environment conditions will correspondingly decrease student learning discipline.

T-test results showed family environment significance values of 0.31, greater than 0.05, and t-calculated values smaller than t-table (1.07 < 1.98). Based on significance values greater than 0.05 and t-calculated values smaller than t-table, Ha was rejected, indicating no significant partial influences between family environment variables and learning discipline variables among Grade X Office Administration and Business Services students at SMK Negeri 6 Surakarta.

Research findings contrasted with Khoeriyah's (2022) research, which found that family environment significantly influenced student discipline. However, this research supported findings by Yadav and Kumari (2020), who discovered that aggression and identification dimensions within families had no significant correlations with high school student study habits, although other dimensions showed positive influences. This indicated that not all family environment aspects played equal roles in forming student academic discipline. Research by Devi and Vaidharani (2024) showed that home environment quality was not significantly related to study habits. Although contextualized in prospective teacher students, these results provided insights that increasing learning independence could reduce direct family roles. These research findings reinforced conclusions that family environments do not always significantly influence student learning discipline, especially when other factors (such as self-regulation, school culture, or peer influences) more determinatively influence student discipline levels.

Based on multiple linear regression analysis results, the equation $Y = 19.790 + 0.449X_1 + 0.042X_2$ was obtained. This indicated that every one-unit increase in self-regulation ($X_1$) would increase learning discipline scores (Y) by 0.449 points, while every one-unit increase in family environment ($X_2$) would increase Y by 0.042 points. Both regression coefficients were positive,

meaning both variable influences on learning discipline were positive in direction. These findings were consistent with research by Baeng et al. (2021), who found that self-regulation had positive influences on vocational student learning discipline, demonstrated through positive regression coefficients in their studies. Additionally, research by Khoeriyah (2022) also showed that family environment contributed positively to student discipline in Islamic education learning. Thus, regression equation results in this research were not only statistically accurate but also supported by similar findings in previous literature.

**Simultaneous Effects of Self-Regulation and Family Environment on Learning Discipline**

Self-regulation and family environment together demonstrated positive and significant effects on learning discipline among Grade X Office Administration and Business Services students at SMK Negeri 6 Surakarta. Higher motivation formed due to self-regulation and better family environments will increase learning discipline among Grade X Office Administration and Business Services students at SMK Negeri 6 Surakarta. Conversely, lower motivation formed due to self-regulation and poorer family environment conditions will correspondingly decrease student learning discipline.

Based on F-test results conducted, probability values in Sig. columns were 0.001, smaller than 0.05, and F-calculated > F-table (19.19 > 3.11). Based on these results, Ho was rejected, meaning significant simultaneous influences existed between self-regulation and family environment variables on learning discipline among Grade X Office Administration and Business Services students at SMK Negeri 6 Surakarta. According to relative contributions in this research, self-regulation contributed higher influences of 30%, while family environment contributed 2%.

This research also supported results by Setiawan (2017), demonstrating that parental child-rearing patterns and self-regulation positively and significantly influenced student discipline at SMP Negeri 17 Agustus 1945 Samarinda. This agreed with research findings by Ardian et al. (2019), stating that internal and external factors influenced student discipline among Grade X IPA 1 students at MAN 1 Pontianak, where self-regulation was included in internal factors and family environment in external factors.

# Conclusion

Based on multiple linear regression analysis results conducted, it was concluded that self-regulation demonstrated positive and significant effects on learning discipline among Grade X OABS students at SMK Negeri 6 Surakarta, as shown by t-calculated values of 5.77 greater than t-table values of 1.98, and significance values of 0.000 ($< 0.05$), thus the first hypothesis was accepted. Meanwhile, family environment showed no significant effects on learning discipline, with t-calculated values of 1.07 smaller than t-table 1.98 and significance of 0.316 ($> 0.05$), thus the second hypothesis was rejected. However, simultaneously, self-regulation and family environment together demonstrated positive and significant effects on learning discipline, with F-calculated values of 19.19 greater than F-table 3.11 and significance values of 0.001 ($< 0.05$), thus the third hypothesis was accepted. The obtained regression equation was $Y = 19.79 + 0.44X_1 + 0.04X_2$, with a coefficient of determination ($R^2$) of 0.312, meaning 31.2% of learning discipline variations could be explained by self-regulation and family environment together. These findings confirmed that self-regulation represents the primary factor influencing learning discipline, and although family environment was not significant individually, in simultaneous contexts it maintained positive contributions in supporting disciplined learning behavior creation among vocational students. The study's practical implications suggest that vocational educators should prioritize self-regulation skill development through targeted interventions, while recognizing that family environment, though individually non-significant, contributes to overall learning discipline when combined with strong self-regulatory capacities. Future research should explore additional factors contributing to the remaining 68.8% of variance in learning discipline and investigate the moderating effects of school culture and peer influences in vocational education settings.

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# Effects of learning methods and self-motivation on students' computational thinking skills

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***Abstrak***

*Penelitian ini bertujuan untuk menganalisis (1) pengaruh langsung metode pembelajaran terhadap kemampuan berpikir komputasional, (2) pengaruh langsung motivasi diri terhadap kemampuan berpikir komputasional, dan (3) peran motivasi diri sebagai mediator antara metode pembelajaran dan kemampuan berpikir komputasional pada siswa Kelas X MPLB SMK Negeri 6 Surakarta. Penelitian kuantitatif ini menggunakan analisis statistik dengan pendekatan metode Partial Least Squares-Structural Equation Modeling (PLS-SEM) menggunakan SmartPLS. Sampel dalam penelitian ini berjumlah 85 siswa. Hasil penelitian menunjukkan bahwa (1) metode pembelajaran berpengaruh positif dan signifikan terhadap kemampuan berpikir komputasional (p-value: 0.000, β: 0.693, t-statistics: 15.211). (2) Motivasi diri juga memberikan pengaruh positif dan signifikan (p-value: 0.000, β: 0.581, t-statistics: 6.073). Temuan lain mengungkapkan adanya (3) pengaruh tidak langsung metode pembelajaran terhadap kemampuan berpikir komputasional melalui motivasi diri (p-value: 0.000, β: 0.451, t-statistics: 5.668). Hasil ini menunjukkan bahwa metode pembelajaran yang baik dapat meningkatkan motivasi siswa, yang pada akhirnya mendorong peningkatan kemampuan berpikir komputasional. Penelitian ini memberikan implikasi penting bagi pendidik dalam merancang metode pembelajaran yang efektif dan memotivasi siswa.*

*Kata kunci: analisis statistik; implikasi; kuantitatif; mediator; SmartPLS*

**Abstract**

This study aimed to analyze: (1) the direct effect of learning methods on computational thinking skills, (2) the direct effect of self-motivation on computational thinking skills, and (3) the mediating role of self-motivation between learning methods and computational thinking skills among Grade X Office Administration and Business Services (OABS) students at SMK Negeri 6 Surakarta. Methods: This quantitative research employed statistical analysis using Partial Least Squares-Structural Equation Modeling (PLS-SEM) with SmartPLS software. The sample comprised 85 students selected through stratified random sampling. Data were collected using validated 4-point Likert scale questionnaires and analyzed through

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both outer and inner model assessments. Results: The findings revealed that: (1) learning methods demonstrated a positive and significant effect on computational thinking skills (p = 0.000, β = 0.693, t = 15.211); (2) self-motivation exhibited a positive and significant effect on computational thinking skills (p = 0.000, β = 0.581, t = 6.073); and (3) self-motivation significantly mediated the relationship between learning methods and computational thinking skills (p = 0.000, β = 0.451, t = 5.668). Conclusion: These results indicate that effective learning methods enhance student motivation, which subsequently improves computational thinking skills. The study provides important implications for educators in designing effective and motivating instructional approaches that foster 21st-century computational competencies.

## Introduction

Computational thinking represents one of the most critical skills amid rapid information technology development. Computational thinking refers to a thinking approach that encompasses the ability to solve problems using computational concepts and principles (Christi & Rajiman, 2023). This cognitive framework serves as an essential foundational skill for confronting life challenges and future complexities characterized by increasing competition and sophistication (Juldial & Haryadi, 2024). Computational thinking capabilities enable individuals to engage in critical and analytical reasoning, which are highly demanded across various professional domains. Furthermore, computational thinking enhances problem-solving expertise that is effective, efficient, and optimal, forming the foundation for creative, critical, and independent solution development (Fauji et al., 2023). The significance of computational thinking as a cognitive process encompasses computer application development and problem-solving facilitation across diverse disciplines, including science, mathematics, and humanities (Megawati et al., 2023).

Contemporary educational contexts require competent human resources as valuable assets for developing millennial generations prepared for emerging challenges, ensuring young people become more prepared and competitive in facing increasingly complex and dynamic global challenges (Rezky et al., 2019). The development of computational thinking has become an integral component of school curricula worldwide. This integration relates to calls for computational thinking to be considered a "21st Century" competency, valuable for all students as a transferable process for problem-solving and building understanding of human behavior and systems (Falloon, 2024). Computational thinking skills are essential for developing new competencies and capabilities in educational contexts due to technological advancement (Alonso-García et al., 2024). However, field evidence indicates that current computational thinking capabilities remain inadequate, as demonstrated by numerous prospective teacher students exhibiting low success expectations and high anxiety toward computational thinking (Barkela et al., 2024).

The challenge of developing student computational thinking abilities involves analyzing requirements for developing innovative approaches to computational thinking in the information age and outlining the necessity for innovative education and instruction (Xiaohong et al., 2021). While efforts to integrate computational thinking into education exist, numerous barriers continue to hinder deep understanding among adolescents and young people. Student acceptance of computational thinking presents educational challenges due to multiple factors requiring attention in computational thinking development. Learning methods represent one factor influencing computational thinking skills (Mueller et al., 2017). Mueller emphasized the importance of using assessment system approaches to measure computational thinking abilities, involving assessment as learning,

assessment of learning, and assessment for learning. This approach helps teachers understand and enhance student computational thinking abilities effectively. Additionally, self-motivation serves as another factor influencing computational thinking, as Yusup et al. (2023) explained that students with strong computational thinking skills tend to demonstrate higher motivation in problem-solving and knowledge development.

Based on preliminary study results through questionnaires distributed to OABS students at SMK Negeri 6 Surakarta, conclusions indicated that computational thinking abilities among OABS competency students at SMK Negeri 6 Surakarta remain suboptimal, though computational thinking represents an alternative for problem-solving. Factors suspected to influence computational thinking abilities among Grade X OABS students at SMK Negeri 6 Surakarta include learning methods and self-motivation.

Self-motivation demonstrates connections to computational thinking, as research by Bers et al. (2014) revealed that intrinsic motivation in children, such as student curiosity and satisfaction in completing challenges, can strengthen computational thinking development. Self-motivation is important because it functions as a driver for achieving positive outcomes. Individuals engage in activities due to internal motivation. High learning motivation enables individuals to achieve optimal results (Rahman, 2022). Self-motivation was selected as a mediator in examining learning method effects on computational thinking abilities, based on research by Copriady (2015) investigating self-motivation as effective mediation between ICT implementation in teaching and ICT application in learning. Research by McDonough and Crocker (2007) also demonstrated that self-motivation can mediate relationships between psychological needs and affective and behavioral outcomes. These studies, combined with connections between self-motivation effects and computational thinking, as well as relationships between self-motivation and learning methods, strengthen the proposition that self-motivation provides both direct effects and effective mediation roles in research.

This research offers novelty compared to previous studies by not only analyzing direct relationships or effects of learning methods and self-motivation on computational thinking abilities, but also examining indirect effects of learning methods on computational thinking abilities through self-motivation as a mediating variable. Based on this background, this research aims to answer primary questions: (1) whether learning methods influence computational thinking abilities among Grade X OABS students at SMK Negeri 6 Surakarta, (2) whether self-motivation influences computational thinking abilities among Grade X OABS students at SMK Negeri 6 Surakarta, and (3) whether learning methods influence computational thinking abilities through self-motivation as a mediating variable. By addressing these questions, this research is expected to provide valuable knowledge for principals, teachers, students, and secondary education policymakers.

## Research Methods

This research was conducted at SMK Negeri 6 Surakarta with research approval according to research permit response letter Number 000.9.2/201, implemented through six stages: preparation, implementation (data collection and analysis), research report compilation, examination, and revision. The research period extended from August 2024 to May 2025. This study employed a quantitative approach with survey methods to examine learning method and self-motivation effects on computational thinking abilities among Grade X OABS students at SMK Negeri 6 Surakarta. The research population comprised 108 students representing all Grade X OABS students at SMK Negeri 6 Surakarta, with a sample of 85 students calculated using the Slovin formula.

The sampling technique employed probability sampling through stratified random sampling to enhance representation of each population stratum. The population was initially divided into three homogeneous strata based on specific characteristics. Stratification criteria were based on class origin, specifically Grade X OABS classes at SMK Negeri 6 Surakarta consisting of three classes (OABS 1, OABS 2, OABS 3). The population was divided into these three strata based on class origin, assuming that learning characteristics and student motivation could differ between classes. Following division, samples were proportionally selected using the Slovin formula from each stratum: 28 students from Grade X OABS 1, 28 students from Grade X OABS 2, and 29 students from Grade X OABS 3, ensuring balanced representation of each group in research data.

Data collection employed researcher-developed questionnaires distributed through Google Forms to targeted students and respondents. Data confidentiality was ensured through aggregate presentation without identifying names or personal identities, strictly for academic purposes without third-party distribution. The selected questionnaire type was closed-ended using a 4-point Likert scale (strongly agree, agree, disagree, strongly disagree), allowing respondents to select answers according to their conditions. The 4-point Likert scale selection, adapted from Sugiyono (2016), was based on considerations to avoid neutral responses (central tendency bias), encouraging respondents to choose positive or negative tendencies more decisively while facilitating data analysis by reducing unnecessary variance.

Prior to research implementation, pilot testing was conducted to measure research validity and reliability for indicators and items developed by researchers. Pilot testing involved 30 Grade X OABS students at SMK Negeri 6 Surakarta, proving valid and reliable for learning method, self-motivation, and computational thinking variables. The learning method variable comprised 5 statements covering 5 indicators: material understanding, student engagement, teacher-student interaction, student independence, and group cooperation. The motivation variable included 5 statements with indicators encompassing: desire and aspiration for success, learning need motivation, future hopes and aspirations, and self-appreciation or reinforcement. The computational thinking variable consisted of 5 statements with specific dimensions including: creativity, algorithmic thinking, critical thinking, problem-solving, and pattern recognition.

This research employed Partial Least Squares-Structural Equation Modeling (PLS-SEM) data analysis techniques using SmartPLS software. PLS-SEM method selection enabled testing direct and indirect relationship effects between research variables. Instrument validity and reliability assessment was conducted through outer model analysis, encompassing convergent validity, discriminant validity, and reliability tests. Hypothesis testing was performed through inner model analysis to determine direct effects of learning methods and self-motivation on computational thinking abilities, as well as indirect effects of learning methods on computational thinking abilities through self-motivation as a mediating variable.

## Results and Discussion

### Results

#### Outer Model Assessment

As presented in Table 1, convergent validity analysis results demonstrated that all research variables learning methods, self-motivation, and computational thinking possessed indicators meeting established criteria. The learning method variable comprised 5 indicators with loading factor values ranging from 0.719 to 0.817 and an Average Variance Extracted (AVE) value of 0.620, indicating that 62% of indicator variance could be explained by the primary construct. The self-motivation variable also consisted of 5 indicators with excellent loading factor values ranging from 0.835 to 0.886 and an AVE value of 0.744, meaning 74% of indicator variance could be explained by the primary construct, demonstrating very strong convergent validity. Meanwhile, the computational thinking variable exhibited loading factors between 0.737 and 0.882 with an AVE of 0.663, showing that 66% of indicator variance could be explained by the primary construct. All loading values exceeded the 0.500 threshold, indicating that these three variables possessed adequate convergent validity and were suitable for use as measurement instruments in this research.

The Heterotrait-Monotrait (HTMT) analysis results shown in Table 2 revealed that all inter-variable relationships in this research fell below the 0.90 threshold, indicating that despite relatively strong correlations between variables, each could still be distinguished as different constructs. HTMT values between computational thinking and learning methods were 0.876, between computational thinking and self-motivation were 0.894, and between learning methods and self-motivation were 0.872. These three values demonstrated relatively high correlations but remained within acceptable limits, ensuring all variables met discriminant validity requirements and could be considered as independent constructs.

**Table 1**
*Loading Factor and Average Variance Extracted (AVE) Values*

| Variable | Item | Loading | AVE | |
|---|---|---|---|---|
| Learning Methods | MP1 | 0.813 | 0.620 | Valid |
| | MP4 | 0.817 | | |
| | MP7 | 0.785 | | |
| | MP12 | 0.801 | | |
| | MP14 | 0.719 | | |
| Self-Motivation | MD3 | 0.860 | 0.744 | Valid |
| | MD4 | 0.880 | | |
| | MD8 | 0.886 | | |
| | MD11 | 0.835 | | |
| | MD12 | 0.849 | | |
| Computational Thinking | BP2 | 0.858 | 0.663 | Valid |
| | BP4 | 0.882 | | |
| | BP7 | 0.774 | | |
| | BP10 | 0.737 | | |
| | BP13 | 0.812 | | |

Source: Data processed with SmartPLS (2025)

**Table 2**
*Heterotrait-Monotrait (HTMT) Values*

| Variable | BP | MP | MD |
|---|---|---|---|
| BP | - | | |
| MP | 0.876 | | |
| MD | 0.894 | 0.872 | - |

Source: Data processed with SmartPLS (2025)

Based on Table 3, the Fornell-Larcker criterion test used to evaluate discriminant validity showed that all research variables met discriminant validity criteria because the square root of AVE for each variable was higher than its correlations with other variables. The square root of AVE for computational thinking (0.814) exceeded its correlations with learning methods (0.758) and self-motivation (0.804), demonstrating that this variable could explain its indicators better than relationships with other constructs. Similarly, the learning method variable possessed a square root of AVE of 0.788, higher than its correlations with computational thinking (0.758) and self-motivation (0.775), indicating good discriminant validity. The same pattern appeared for self-motivation, with a square root of AVE of 0.862, greater than its correlations with computational thinking (0.804) and learning methods (0.775). Consequently, these three variables could be considered as validly different and non-overlapping constructs.

**Table 3**

*Fornell-Lacker Criterion Values*

| Variable | BP | MP | MD |
|---|---|---|---|
| BP | 0.814 | | |
| MP | 0.758 | 0.788 | |
| MD | 0.804 | 0.775 | 0.862 |

Source: Data processed with SmartPLS (2025)

**Table 4**

*Cross Loading*

| | MP | MD | BP |
|---|---|---|---|
| MP1 | 0.813 | 0.617 | 0.627 |
| MP2 | 0.817 | 0.612 | 0.532 |
| MP3 | 0.785 | 0.550 | 0.525 |
| MP4 | 0.801 | 0.639 | 0.655 |
| MP5 | 0.719 | 0.620 | 0.625 |
| MD1 | 0.573 | 0.860 | 0.619 |
| MD2 | 0.744 | 0.880 | 0.600 |
| MD3 | 0.736 | 0.886 | 0.771 |
| MD4 | 0.655 | 0.835 | 0.788 |
| MD5 | 0.611 | 0.849 | 0.662 |
| BP1 | 0.648 | 0.624 | 0.858 |
| BP2 | 0.627 | 0.649 | 0.882 |
| BP3 | 0.537 | 0.663 | 0.774 |
| BP4 | 0.584 | 0.689 | 0.737 |
| BP5 | 0.680 | 0.641 | 0.812 |

Source: Data processed with SmartPLS (2025)

As demonstrated in Table 4, cross-loading analysis results indicated that all indicators from the three variables learning methods, self-motivation, and computational thinking exhibited highest loading values on their respective construct variables compared to other variables, confirming discriminant validity fulfillment. Learning Method indicators (MP1 through MP5) showed highest loadings on the learning method variable; for example, MP1 demonstrated a loading value of 0.813 on learning methods, substantially higher than on self-motivation (0.617) and computational thinking (0.627), indicating these indicators better represented the learning method construct. Similarly, Self-Motivation indicators (MD1 through MD5) exhibited highest loadings on self-motivation, such as MD1 with a loading value of 0.860 on self-motivation compared to learning methods (0.573) and computational thinking (0.619), demonstrating that these indicators consistently reflected the self-motivation variable. The same pattern occurred for Computational Thinking indicators (BP1 through BP5), which displayed highest loadings on computational

thinking, such as BP1 with a loading value of 0.858 on its own construct, higher than learning methods (0.648) and self-motivation (0.624). Consequently, each indicator maintained stronger relationships with its original variable compared to other variables, ensuring good discriminant validity for all three variables.

Table 5 presents Composite Reliability (CR) analysis results, showing that all research variables learning methods, self-motivation, and computational thinking demonstrated high reliability levels because Composite Reliability values exceeded the 0.70 threshold. The learning method variable exhibited a Composite Reliability value of 0.848, indicating strong inter-indicator correlation and robust internal consistency, making it dependable for research purposes. The self-motivation variable achieved an exceptionally high Composite Reliability value of 0.918, signifying that constituent indicators were highly consistent in measuring the construct, establishing it as a highly reliable measurement instrument. Meanwhile, the computational thinking variable's Composite Reliability value of 0.871 also demonstrated high internal consistency levels, indicating trustworthiness in measuring intended concepts. Consequently, all three variables possessed satisfactory measurement quality and could be reliably employed in research applications.

**Table 5**
*Composite Reliability (CR) Values*

| Variable | *Composite Reliability* | Status |
|---|---|---|
| MP | 0.848 | Reliabel |
| MD | 0.918 | Reliabel |
| BP | 0.871 | Reliabel |

Source: Data processed with SmartPLS (2025)

As shown in Table 6, reliability testing using Cronbach's Alpha values demonstrated that all research variables learning methods, self-motivation, and computational thinking exhibited satisfactory internal consistency because all values exceeded the 0.70 threshold. The Cronbach's Alpha value for learning methods was 0.847, indicating consistent inter-indicator correlation and research dependability. The self-motivation variable achieved the highest value at 0.914, signifying very strong reliability and indicator consistency in measuring self-motivation aspects, ensuring trustworthy and stable measurement results. Meanwhile, the computational thinking variable demonstrated a Cronbach's Alpha value of 0.871, also indicating high reliability and satisfactory indicator suitability in measuring computational thinking concepts. Therefore, all three variables possessed adequate dependability for various research analyses, ensuring consistent data capture across different respondents and strengthening internal research validity through accurate variable representation.

**Table 6**
*Cronbach's alpha (α) Values*

| Variable | *Cronbach's alpha* | Status |
|---|---|---|
| MP | 0.847 | Reliabel |
| MD | 0.914 | Reliabel |
| BP | 0.871 | Reliabel |

Source: Data processed with SmartPLS (2025)

Table 7 indicates that all Variance Inflation Factor (VIF) values fell within acceptable ranges between 1.000-2.506, well below the threshold of 5, signifying no multicollinearity problems in the

conducted research. These favorable VIF values enabled continuation of research processes through hypothesis testing.

**Table 7**
*VIF Result Values*

|  | BP | MP | MD |
|---|---|---|---|
| BP |  |  |  |
| MP | 2.506 |  | 1.000 |
| MD | 2.506 |  |  |

Source: Data processed with SmartPLS (2025)

Based on Table 8, R-square analysis results revealed that 61.6% of variance in computational thinking variables could be explained by learning method and self-motivation variables, while the remaining 38.4% was influenced by factors outside the research model. The $R^2$ value of 0.616 fell within the substantial category, indicating that this research model was sufficiently robust in explaining factors influencing computational thinking abilities. Meanwhile, the $R^2$ value for self-motivation was 0.601, meaning 60.1% of variance in self-motivation could be explained by learning method variables, demonstrating that learning methods played important roles in shaping student motivation. Similar to previous findings, this $R^2$ value also belonged to the substantial category, indicating that the model possessed high predictive strength in explaining factors influencing student self-motivation.

**Table 8**
*R-Square ($R^2$) Result  Values (Coefficient of Determination)*

| Variable | R-Square ($R^2$) | Description |
|---|---|---|
| BP | 0.616 | Substantial |
| MD | 0.601 | Substantial |

Source: Data processed with SmartPLS (2025)

As presented in Table 9, f-square test results showed that the $f^2$ value for learning method effects on computational thinking was 0.061, categorized as weak, indicating that learning methods provided only small contributions to computational thinking variation. This suggested that other more dominant factors, such as learning environments or cognitive intelligence, might play greater roles in influencing computational thinking abilities. Conversely, the $f^2$ value of 1.506 demonstrated that learning methods exerted very strong effects on student self-motivation, supporting theories that innovative learning approaches such as project-based learning or gamification could enhance learning motivation. Meanwhile, the $f^2$ value for self-motivation effects on computational thinking of 0.351 was also categorized as strong, indicating that self-motivation played important roles in enhancing student computational thinking abilities, particularly through intrinsic factors such as curiosity, persistence, and learning desire. Additionally, the upsilon (υ) value of 0.774 showed that self-motivation possessed strong mediation roles in relationships between learning methods and computational thinking abilities, significantly exceeding the 0.14 threshold.

**Table 9**
*f-Square (f²) Result Values*

| Variable | f-square (f²) | upsilon (v) | Description |
|----------|---------------|-------------|-------------|
| MP -> BP | 0.061 | | Weak |
| MP -> MD | 1.506 | | Strong |
| MD -> BP | 0.351 | | Strong |
| MP -> MD -> BP | | 0.774 | Strong |

Source: Data processed with SmartPLS (2025)

Table 10 displays Q² values for predictive relevance assessment. Learning methods achieved Q² = 0.272, indicating predictive relevance and demonstrating that indicators within learning methods could adequately explain variance in the construct. Self-motivation exhibited Q² = 0.300, also showing predictive relevance and indicating that indicators within self-motivation could explain the variable satisfactorily. Computational thinking demonstrated Q² = 0.391, signifying higher predictive relevance compared to learning methods and self-motivation.

**Table 10**
*Q² Result Values*

| Variable | Q² Result | Description |
|----------|-----------|-------------|
| MP | 0.272 | Has Predictive Relevance |
| MD | 0.300 | Has Predictive Relevance |
| BP | 0.391 | Has Predictive Relevance |

Source: Data processed with SmartPLS (2025)

As demonstrated in Table 11, all research hypotheses proved significant. The first hypothesis showed that learning methods significantly and positively influenced computational thinking abilities, with t-statistics of 15.211 and p-value below 0.05, explaining 69.3% of computational thinking variance. The 95% confidence interval indicated learning method effects ranged between 0.607 and 0.785, meaning improved learning methods corresponded to enhanced computational thinking abilities. The second hypothesis confirmed that self-motivation also significantly influenced computational thinking, with t-statistics of 6.073 and p-value of 0.000, explaining 58.1% of computational thinking ability variance. The confidence interval showed self-motivation effects ranged from 0.391 to 0.848. Meanwhile, the third hypothesis demonstrated that self-motivation significantly mediated learning method effects on computational thinking, with t-statistics of 5.668 and p-value of 0.000. Indirect effects of learning methods through self-motivation exhibited confidence intervals between 0.306 and 0.690, explaining 45.1% of computational thinking ability variance, confirming that self-motivation played important roles as a mediator.

**Table 11**
*Final Results*

| Variable | β | t statistics | p values | Confidence Interval (CI) | | Significance |
|---|---|---|---|---|---|---|
| | | | | 2.5% | 97.5% | |
| MP => BP | 0.243 | 2.272 | 0.023 | 0.607 | 0.785 | Sig |
| MD => BP | 0.581 | 6.073 | 0.000 | 0.391 | 0.848 | Sig |
| MP => MD => BP | 0.451 | 5.668 | 0.000 | 0.306 | 0.620 | Sig |

Source: Data processed with SmartPLS (2025)

Figure 1 illustrates the structural model results, displaying path coefficients and significance levels between constructs. The figure demonstrates the direct relationships between learning methods and computational thinking, self-motivation and computational thinking, as well as the mediating pathway through self-motivation.

**Figure 1**
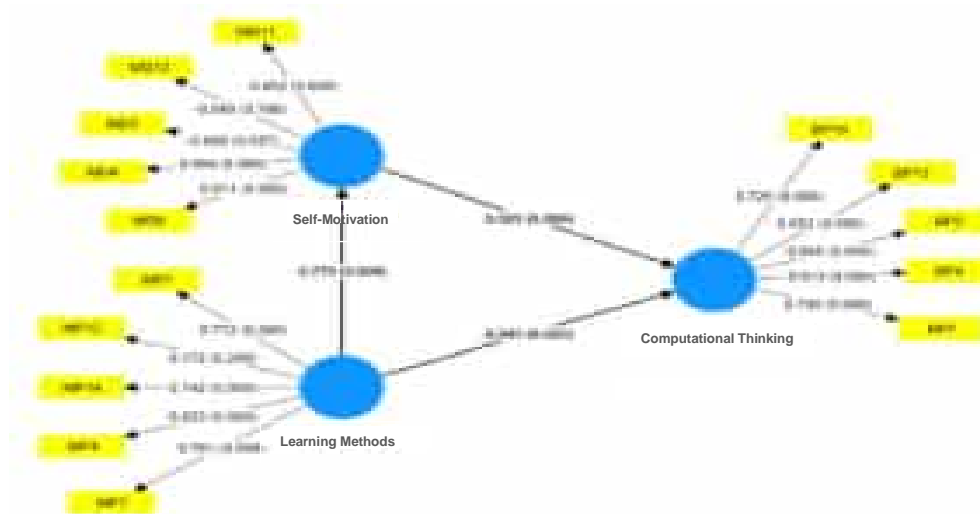*Final structural model results*



Table 12 presents model fit evaluation results. The Standardized Root Mean Square Residual (SRMR) values for both saturated and estimated models were 0.078, falling below the 0.08 threshold and within the 95% confidence interval (0.082-0.088), indicating good model fit between observed data and theoretical models. Additionally, the d_ULS (Difference of Unweighted Least Squares) value of 0.733 and d_G (Difference of Geodesic Distance) value of 0.318 for estimated models also fell below the upper bounds of 95% confidence intervals from bootstrapping results, specifically 0.805-0.939 for d_ULS and 0.424-0.485 for d_G. These results indicated no significant differences between models and empirical data, confirming structural model adequacy. Overall, evaluation results confirmed that research models met satisfactory fit criteria and were valid for further analysis and hypothesis testing.

**Table 12**
*Model Fit and Quality Evaluation*

| Fit Index | Model | Original Sample (O) | Sample Mean (M) | 95% CI | 99% CI |
|---|---|---|---|---|---|
| SRMR | Saturated model | 0.078 | 0.070 | 0.082 | 0.088 |
| | Estimated model | 0.078 | 0.070 | 0.082 | 0.088 |
| d-ULS | Saturated model | 0.733 | 0.593 | 0.805 | 0.939 |
| | Estimated model | 0.733 | 0.593 | 0.805 | 0.939 |
| d-G | Saturated model | 0.318 | 0.312 | 0.424 | 0.485 |
| | Estimated model | 0.318 | 0.312 | 0.424 | 0.485 |

Source: Data processed with SmartPLS (2025)

**Discussion**

Computational thinking represents a crucial aspect because it trains individuals to solve problems systematically, logically, and efficiently in the technology-driven digital era. Through computational thinking, students not only learn to understand technological operations but also develop analytical thinking patterns involving complex problem-solving. These skills are highly relevant not only for information technology fields but also beneficial in daily life and increasingly data- and technology-based work environments. Therefore, equipping students with computational thinking abilities helps them become adaptive, creative individuals prepared to face future challenges in Industry 4.0 and society.

This research focused on predicting and examining roles of two exogenous variables expected to provide significant effects on student skills in educational contexts, primarily computational thinking abilities. These two variables encompassed learning methods and self-motivation, selected based on various theoretical foundations and previous research results supporting their relevance in student thinking skill contexts.

For Hypothesis 1, research results demonstrated that learning methods significantly influenced computational thinking abilities among SMK Negeri 6 Surakarta students with a 24.3% contribution. These findings aligned with previous research by Mardiany et al. (2024) and Tedre and Denning (2016), which similarly showed positive relationships between learning methods and computational thinking abilities. Item analysis revealed that learning method variable indicators possessed loading factor values between 0.719 and 0.817, indicating that each indicator sufficiently supported research implementation. Learning Method indicator 4 (MP4), for example, demonstrated that classroom activities encouraging active student participation positively impacted computational thinking abilities. Studies by Grover and Pea (2018) and Kalelioglu et al. (2016) reinforced these results by emphasizing the importance of collaboration and student engagement. Learning Method indicators 1 (MP1) and 14 (MP14) reflected that material understanding and student comfort in learning significantly influenced computational thinking processes. Additionally, indicators such as Learning Method 7 (MP7) and 12 (MP12) showed the importance of effective communication and student independence in learning processes. Learning Method 14 (MP14) also confirmed that group work could enhance learning effectiveness. Overall, learning methods proved to provide significant and positive effects on computational thinking abilities (t statistics = 2.272, p value = 0.023), supported by indicator strength within the variable. These findings were reinforced by research by Angeli et al. (2016), demonstrating that learning methods represent key factors in developing student computational thinking abilities.

For Hypothesis 2, research results indicated that self-motivation significantly influenced computational thinking abilities among SMK Negeri 6 Surakarta students, with a 58.1% contribution, demonstrating the important role of this variable in supporting computational thinking ability development. Conducted tests proved significant relationships between self-motivation as exogenous variables and computational thinking abilities as endogenous variables. These findings aligned with previous research by Yusup et al. (2023), Supiarmo et al. (2021), and Ryan and Deci

(2020), stating that intrinsic motivation contributed to cognitive abilities, including computational thinking contexts. Items within self-motivation variables possessed loading factors ranging from 0.835 to 0.886, indicating strong contributions from each indicator. For example, Self-Motivation 3 (MD3) described strong student desires for success, Self-Motivation 4 (MD4) showed motivation due to educational importance, and Self-Motivation 8 (MD8) emphasized positive views toward academic achievement as motivation forms. Additionally, Self-Motivation items 11 (MD11) and 12 (MD12) confirmed that encouragement from teachers and peers, as well as pride in personal achievements, strengthened student motivation. These findings were supported by discoveries from Yeager et al. (2019), stating that growth mindset approaches could enhance student engagement. Overall, self-motivation variables demonstrated significant positive effects on computational thinking abilities (t statistics = 6.073, p value = 0.000), as all indicators provided strong contributions supporting self-motivation roles. Consequently, higher student self-motivation corresponded to enhanced computational thinking abilities.

For Hypothesis 3, this research examined whether learning methods possessed indirect effects on computational thinking abilities through self-motivation as mediators. Test results showed that despite non-significant direct effects of learning methods on computational thinking abilities (t statistics: 5.668, p value: 0.000, β: 0.451), indirect effect contributions reached 45.1% of total effects of 0.693. This meant self-motivation played important roles as partial mediators because portions of learning method effects on computational thinking abilities were channeled through self-motivation. These findings aligned with research by Tabas et al. (2024) and Prihanggara et al. (2024), demonstrating that learning methods influenced student self-motivation improvements by 30.5%. Previous research also supported that learning methods could trigger motivation, ultimately impacting computational thinking ability enhancement. When self-motivation increased, students tended to become more active, persistent, and interested in solving problems systematically. These results aligned with research by Copriady (2015) and McDonough and Crocker (2007), concluding that self-motivation effectively mediated learning method effects on computational thinking abilities. Therefore, self-motivation was believed capable of strengthening indirect relationships between learning methods and computational thinking abilities significantly.

## Conclusion

This research demonstrated that learning methods and self-motivation exerted significant and positive effects on computational thinking abilities among Grade X OABS students at SMK Negeri 6 Surakarta. Implementing effective learning methods enhanced student computational thinking abilities, while high self-motivation also encouraged ability improvement. Additionally, findings revealed that learning methods indirectly influenced computational thinking abilities through self-motivation mediation roles, representing novel discoveries distinguishing this research from previous studies such as research by Yusup et al. (2023) and Mardiany et al. (2024), or other studies referenced in this research. This means that improved learning methods correspond to enhanced student self-motivation, ultimately improving computational thinking abilities. Nevertheless, this research possessed several limitations, including items with low loading factor values that did not fully support conducted analyses. Therefore, deeper instrument development was necessary, such as strengthening initial validity testing or revising suboptimal items. Additionally, f-square values for learning method effects on computational thinking abilities remained weak, suggesting the need for further research model development by adding relevant variables or strengthening instrument constructs to capture stronger and more meaningful effects. This research proved novelty through discovering indirect effects of learning methods on computational thinking abilities through self-motivation mediation. The study concluded that combinations of learning methods and self-motivation played important roles in enhancing computational thinking abilities. Implementing appropriate learning methods and improving student self-motivation could enhance student computational thinking abilities. The study's implications for educational practice suggest that vocational educators should focus on developing innovative learning methods that simultaneously enhance student self-motivation, as this dual approach proves most effective for developing computational thinking skills. Future research should explore additional factors contributing to

computational thinking development and investigate the effectiveness of specific pedagogical interventions in different vocational education contexts.

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