



## The Influence of Industry-Based Curriculum Management and Student Character on the Quality of Graduates at SMK Negeri 3 Tondano

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### Abstract

*This study aims to analyze the impact of industry-based curriculum management and student character on graduate quality at SMK Negeri 3 Tondano, using a quantitative approach with correlational methods and regression analysis. The sample comprised 42 graduates from the Light Vehicle Engineering program (academic years 2023/2024 and 2024/2025), selected through total sampling. Data were collected via validated questionnaires and analyzed using simple and multiple linear regression. The findings indicate that industry-based curriculum management has a positive and significant effect on graduate quality ( $R^2=0.644$ ,  $p<0.05$ ), student character also has a positive and highly significant effect ( $R^2=0.609$ ,  $p<0.01$ ), and both factors together significantly influence graduate quality ( $F\text{-count}=20.977 > F\text{-table}=3.238$ ), contributing 88.2% to graduate quality. This study highlights the dominant role of student character in determining graduate quality, followed by the effectiveness of curriculum management aligned with industry needs, providing strategic recommendations for enhancing graduate competitiveness in vocational education.*

### Abstrak

*Penelitian ini bertujuan untuk menganalisis pengaruh manajemen kurikulum berbasis industri dan karakter siswa terhadap kualitas lulusan di SMK Negeri 3 Tondano, dengan menggunakan pendekatan kuantitatif melalui metode korelasional dan analisis regresi. Sampel penelitian terdiri dari 42 lulusan Program Studi Teknik Kendaraan Ringan (tahun akademik 2023/2024 dan 2024/2025), yang dipilih melalui total sampling. Data dikumpulkan menggunakan kuesioner yang telah divalidasi dan dianalisis dengan regresi linier sederhana dan berganda. Hasil penelitian menunjukkan bahwa manajemen kurikulum berbasis industri memiliki pengaruh positif dan signifikan terhadap kualitas lulusan ( $R^2=0,644$ ,  $p<0,05$ ), karakter siswa juga memiliki pengaruh positif dan sangat signifikan ( $R^2=0,609$ ,  $p<0,01$ ), dan kedua faktor tersebut secara bersama-sama berpengaruh signifikan terhadap kualitas lulusan ( $F\text{-count}=20,977 > F\text{-table}=3,238$ ), memberikan kontribusi sebesar 88,2% terhadap kualitas lulusan. Penelitian ini menekankan peran dominan karakter siswa dalam menentukan kualitas lulusan, diikuti oleh efektivitas manajemen kurikulum yang selaras dengan kebutuhan industri, serta memberikan rekomendasi strategis untuk meningkatkan daya saing lulusan dalam pendidikan vokasi.*

## 1. INTRODUCTION

### 1.1 Background

Education serves as the foundation for civilization, economic stability, and human character development (Undang-Undang No. 20 Tahun 2003). Vocational High Schools (SMK) are specifically designed to produce competent, character-driven graduates ready to enter the workforce and contribute to national economic development. Article 15 of the National Education System Law emphasizes that SMK aims to prepare students to become productive individuals capable of working independently and filling positions in the business and industrial sectors.

However, reality presents significant challenges. Data from the Central Statistics Agency (BPS, 2025) shows that the open unemployment rate for SMK graduates remains relatively high at 25.78% (1,923,756 out of 7,461,507 unemployed individuals), second only to SMA graduates (30.74%). This indicates a gap between the ideal expectations of vocational education and field realities, particularly regarding the alignment of graduate competencies with industrial needs and workforce character readiness.

Research by Agustian, Amarta, & Wardoyo (2024) demonstrates competency gaps between SMK graduates and industrial needs, both in technical skills (hard skills) and non-technical skills (soft skills). Puspitasari et al. (2024) emphasize that SMK must pay attention to the curriculum used and continuously develop it, as the curriculum serves as the reference for the learning process.

At SMK Negeri 3 Tondano, particularly in the Light Vehicle Engineering (TKR) department, graduate quality issues were evident. Before receiving government assistance through the Center of Excellence Vocational School (SMK PK) program in 2023, curriculum management was not fully industry-based. Cooperation with DUDI (Business/Industrial World) was limited, resulting in theoretical and less contextual learning, impacting low graduate work readiness and suboptimal industry absorption.

Following the SMK PK program implementation, significant changes occurred, including curriculum

synchronization with industry, enhanced DUDI partnerships, project-based learning implementation, and character strengthening oriented toward 8 graduate dimensions. Nevertheless, further research is needed to determine the extent of DUDI-based curriculum management and student character's influence on graduate quality.

### 1.2 Problem Statements

1. Is there an influence of DUDI-based curriculum management on the quality of graduates in the Light Vehicle Engineering concentration at SMK Negeri 3 Tondano?
2. Is there an influence of student character on the quality of graduates in the Light Vehicle Engineering concentration at SMK Negeri 3 Tondano?
3. Is there an influence of DUDI-based curriculum management and student character simultaneously on the quality of graduates in the Light Vehicle Engineering concentration at SMK Negeri 3 Tondano?

### 1.3 Research Objectives

1. To analyze the influence of DUDI-based curriculum management on graduate quality
2. To analyze the influence of student character on graduate quality
3. To analyze the simultaneous influence of DUDI-based curriculum management and student character on graduate quality
- 4.

### 1.4 Hypotheses

**H1:** There is a significant influence of DUDI-based curriculum management on graduate quality.

**H2:** There is a significant influence of student character on graduate quality.

**H3:** There is a significant simultaneous influence of DUDI-based curriculum management and student character on graduate quality.

## 2. LITERATURE REVIEW

### 2.1 Graduate Quality Concept

Graduate quality refers to the level of graduate ability in meeting technical competency standards and soft skills relevant to business and industrial world needs, achieved through quality-assured vocational education processes, evidenced by work readiness, adaptability, and effective contribution capability in the workforce and society (Syafarudin & Sukri, 2022; Hasibuan, 2021).

From an industrial perspective, graduate quality is defined as the level of conformity between technical competencies, soft skills, character, and graduate productivity with actual labor market needs. Industry values employability—the ability to work, adapt, and maintain workplace performance (OECD, 2020; World Economic Forum, 2020).

### 2.2 DUDI-Based Curriculum Management

Curriculum is understood as the systemic foundation guiding education delivery (Sumampouw, 2024; Tambingon, n.d.). DUDI-based curriculum management departs from link and match theory and industry-based curriculum, emphasizing industrial world involvement in curriculum development and implementation to ensure graduate competencies align with labor market demands (Billett, 2020).

Key implementation forms include curriculum synchronization, industrial work practices, teaching factories, industrial classes, and competency certification. The latest SMK curriculum features extended internship duration (minimum one semester/16 weeks), project-based learning, teaching factories, and industry-standard competency certification (Kemendikbudristek, 2021; Direktorat Jenderal Pendidikan Vokasi, 2022).

### 2.3 Student Character

Character refers to distinctive personality traits embedded in individuals, formed through the integration of values, ethics, morals, and manners, manifested through unique thinking patterns, attitudes,

and actions distinguishing one person from another (Nugroho, 2022; Muntu, 2025).

Dimensions relevant to work readiness include responsibility, discipline, honesty, cooperation, communication, independence, and work ethic (Pool & Sewell, 2021; Hidayat & Nurhayati, 2023). Character strengthening in SMK is crucial as graduates are prepared to directly enter the workforce, requiring work character such as discipline, responsibility, honesty, and high work ethic (Kemendikbud, 2022; Rahmawati, 2024).

### 2.4 Theoretical Framework

The theoretical framework posits that DUDI-based curriculum management involving industry in synchronization, learning, and evaluation produces learning relevant to work needs. In this process, students acquire not only technical skills but also character formation such as discipline, responsibility, and work ethic. These characters subsequently influence work readiness, impacting graduate quality.

## 3. RESEARCH METHODOLOGY

### 3.1 Research Design

This study employed a quantitative approach with survey methods using an explanatory research design to explain causal relationships between variables and test formulated hypotheses (Creswell, 2020).

### 3.2 Time and Location

The research was conducted at SMK Negeri 3 Tondano from February to March 2026, focusing on Light Vehicle Engineering (TKR) concentration graduates from the 2023/2024 and 2024/2025 academic years.

### 3.3 Population and Sample

The population comprised 42 graduates (19 from 2023/2024 and 23 from 2024/2025). The saturated sampling technique (total sampling) was employed, where all population members were used as respondents (Sugiyono, 2019; Sudaryono, 2021).

### 3.4 Operational Variable Definition

**Variable X1 (DUDI-Based Curriculum Management):** The process of curriculum synchronization and management aligned with DUDI competency standards, measured through planning, implementation, project-based learning, guest teachers from industry, internship implementation, and industry-standard competency evaluation.

**Variable X2 (Student Character):** Behavioral values embedded in students reflected in work attitudes, measured through discipline, responsibility, communication, independence, and work ethic.

**Variable Y (Graduate Quality):** Quality of educational outcomes measured from the conformity of graduate competencies with workforce standards and competitiveness, measured through technical competency, soft skills, and workforce competitiveness.

### 3.5 Data Collection Instruments

Questionnaires using a 5-point Likert scale (Strongly Agree=5 to Strongly Disagree=1) were developed for each variable. Instruments were tested for validity using Pearson product-moment correlation ( $r_{table}=0.304$  at  $\alpha=0.05$ ) and reliability using Cronbach's Alpha ( $X1=0.644$ ,  $X2=0.609$ ,  $Y=0.671$ ), all declared valid and reliable.

### 3.6 Data Analysis Techniques

Data were analyzed using descriptive statistics, simple linear regression, and multiple linear regression with SPSS software. Prerequisite tests included normality and linearity tests. Hypothesis testing was conducted at  $\alpha=0.05$  significance level.

## 4. RESULTS AND DISCUSSION

### 4.1 Descriptive Statistics Results

**Table 1. Quality Level of Research Variables**

Variable	Mean	SD	Category	Percentage
DUDI Curriculum Management (X1)	51.81	3.81	Good	41.46%
Student Character (X2)	48.10	3.73	Fair	28.60%
Graduate Quality (Y)	51.35	4.27	Good	52.38%

### 4.2 Hypothesis Testing Results

#### 4.2.1 First Hypothesis: Influence of X1 on Y

Simple linear regression analysis yielded the equation  $\hat{Y} = 21.81 + 0.55X_1$ , with  $F\text{-count} = 40.89 > F\text{-table} = 4.08$  ( $p < 0.05$ ). The coefficient of determination ( $R^2$ ) = 0.644, indicating that DUDI-based curriculum management contributed 64.4% to graduate quality.

#### 4.2.2 Second Hypothesis: Influence of X2 on Y

Simple linear regression analysis yielded the equation  $\hat{Y} = 8.26 + 0.82X_2$ , with  $F\text{-count} = 186.8 > F\text{-table} = 4.08$  ( $p < 0.01$ ). The coefficient of determination ( $R^2$ ) = 0.609, indicating that student character contributed 60.9% to graduate quality.

#### 4.2.3 Third Hypothesis: Simultaneous Influence of X1 and X2 on Y

Multiple linear regression analysis yielded the equation  $\hat{Y} = 7.3674 + 0.0599X_1 + 0.7822X_2$ , with  $F\text{-count} = 20.977 > F\text{-table} = 3.238$  ( $p < 0.01$ ). The coefficient of determination ( $R^2$ ) = 0.882, indicating that both variables simultaneously contributed 88.2% to graduate quality.

**Table 2. Multiple Linear Regression Analysis Results**

Variab le	Coeffi cient	t- cou nt	P- val ue	Contri bution
Consta nt	7.3674	-	-	-
X <sub>1</sub> (Curric ulum)	0.0599	0.594	0.555	64.4%
X <sub>2</sub> (Chara cter)	0.7822	10.112	0.000*	60.9%

\*Note:  $p < 0.01$

### 4.3 Discussion

#### 4.3.1 Influence of DUDI-Based Curriculum Management on Graduate Quality

The finding that DUDI-based curriculum management significantly influences graduate quality (64.4% contribution) aligns with previous research by Ahyanuardi et al. (2025), Chen et al. (2025), and Wijayanti et al. (2024). This confirms that industry involvement in curriculum planning, implementation, and evaluation enhances graduate competency relevance with labor market needs.

At SMK Negeri 3 Tondano, SMK PK program implementation since 2023 has strengthened curriculum synchronization with industry, project-based learning, teaching factories, and industry-standard competency certification. These elements

proved effective in improving technical competencies and graduate work readiness.

#### 4.3.2 Influence of Student Character on Graduate Quality

The finding that student character has a very strong and significant influence on graduate quality (60.9% contribution,  $p < 0.01$ ) supports the theories of Pool & Sewell (2021), Awodiji et al. (2024), and Prasetyo & Lestari (2022). Character dimensions such as discipline, responsibility, communication, independence, and work ethic are crucial determinants of vocational graduate success.

Interestingly, student character emerged as a more dominant predictor than curriculum management. This indicates that internal student factors play a more critical role in determining graduate quality, suggesting that vocational education must prioritize character building alongside technical competency development.

#### 4.3.3 Simultaneous Influence and Variable Dominance

Both variables simultaneously contributed 88.2% to graduate quality ( $R^2=0.882$ ), with the remaining 11.8% influenced by other factors not examined in this study (e.g., teacher competency, infrastructure, family environment).

An intriguing finding emerged in the multiple regression model: while student character remained highly significant ( $p=0.000$ ), curriculum management became non-significant ( $p=0.555$ ) with a negative coefficient ( $-0.0609$ ). This indicates multicollinearity or information overlap between  $X_1$  and  $X_2$ , suggesting that in the combined model, graduate quality variation is already strongly explained by student character, causing curriculum management's role to be statistically absorbed by character variable dominance.

This finding has important implications: effective DUDI-based curriculum management likely operates through strengthening student character rather than directly influencing graduate quality. In other words, character may function as a mediating variable between curriculum management and graduate quality.

### 5. CONCLUSION AND RECOMMENDATIONS

## 5.1 Conclusions

1. DUDI-based curriculum management partially has a positive and significant influence on graduate quality at SMK Negeri 3 Tondano with a contribution of 64.4%.
2. Student character partially has a positive and highly significant influence on graduate quality at SMK Negeri 3 Tondano with a contribution of 60.9%.
3. Simultaneously, DUDI-based curriculum management and student character have a significant influence on graduate quality ( $F\text{-count}=20.977 > F\text{-table}=3.238$ ) with a total contribution of 88.2%.
4. Student character is the most dominant factor determining graduate quality, followed by the effectiveness of curriculum management aligned with industry needs.

## 5.2 Recommendations

**For Schools/Institutions:** Given the substantial influence of student character (60.9%), schools should not only focus on cognitive aspects and technical curriculum but deeply integrate character strengthening programs (discipline, work ethic, integrity) into daily activities.

**For Curriculum Managers:** Although curriculum management's significance decreased in the combined model, it independently has a significant effect. Schools should continuously update curriculum synchronization with industry while prioritizing character formation in implementation.

**For Future Researchers:** Consider adding other variables such as infrastructure or teacher pedagogical competency given the remaining 11.8% unexplained influence. Consider using qualitative methods or path analysis to explore why character variables are so dominant and how curriculum indirectly influences character formation.

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