



# Factors Influencing Vocational High School Graduates' Career Pathways: Education, Public Service, and Entrepreneurship in Aceh

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## Authors' contributions

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## Abstract

Vocational high school graduates in the East Coast Region of Aceh face notable challenges in deciding whether to continue their education or enter the workforce. This study examines how vocational high schools in the East Coast of Aceh align with local economic opportunities by analyzing the factors influencing graduates' decisions to pursue higher education, careers in public service (police, military, civil service), or entrepreneurship. Using Simple Linear Regression analysis on data from 81 graduates across three districts, the study reveals that 85.4% ( $R^2 = 0.854$ , Pearson correlation 0.924) of variance in graduates' career choices toward higher education or public service can be explained by the number of vocational graduates, while only 54.45% ( $R^2 = 0.5445$ , Pearson correlation 0.566) choose entrepreneurship. The strong preference for higher education and public service is driven by the desire for socioeconomic mobility, job security, and social prestige, with familial and environmental influences playing critical roles. The significantly weaker entrepreneurial

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interest stems from barriers including lack of access to capital, limited business mentorship, inadequate entrepreneurial training in curricula, and perceived risks. The findings contribute to vocational education research by demonstrating the persistent mismatch between vocational training outputs and regional labor market needs, particularly in contexts with limited private-sector growth. The study highlights the urgent need for targeted policies addressing entrepreneurial barriers through curriculum reform, mentorship programs, access to startup capital, and stronger partnerships between vocational schools and local businesses. These insights support the development of educational reforms that improve graduate employability and foster regional economic development aligned with Sustainable Development Goals for quality education and decent work.

**Keywords:** *Vocational education, higher education pathways, public service careers, entrepreneurship, labor market alignment, Aceh graduates, regional development.*

## 1. INTRODUCTION

The development of the education sector plays a pivotal role in addressing high unemployment rates, largely caused by mismatches between graduates' skills and available formal job opportunities (Nugroho et al., 2021; Rizkiyah, 2015). Education is a key factor in reducing unemployment and enhancing human resource quality. The Sustainable Development Goals (SDGs) emphasize education's importance as a means to end hunger, achieve food security, and promote sustainable agriculture by 2030[3][4]. Within this framework, vocational education is critical in equipping individuals with necessary skills to contribute to both local and global economies (Dixit, P., & Ravichandran, R., 2023).

Government initiatives in Indonesia have increasingly focused on improving human resources by enhancing practical and life skills in students. Currently, Indonesia has approximately 55 million skilled workers; to meet projected 2030 targets, an additional 58 million are required (Rizkiyah, 2015; Aprianto, D., 2013). Vocational high schools (SMKs) are vital components in supplying this workforce. Regional planning, especially in human resource development, demands comprehensive approaches addressing not only educational needs but also economic, social, and environmental factors (Hariram et al., 2023).

Vocational education plays a crucial role in preparing students for the workforce by equipping them with industry-relevant skills (Billett, S., 2011). Both internal factors—such as human and natural resources—and external influences like regional opportunities and threats must be considered to ensure development of skilled graduates (Hariram et al., 2023; Handoyo et al., 2023). This comprehensive perspective is key to ensuring vocational education programs align with labor market demands, particularly in regions where industrial growth is a priority (Li, L., 2022).

However, existing research reveals significant gaps in understanding how vocational graduates' career decisions relate to regional economic contexts, especially in areas with limited private-sector opportunities. While studies document skill mismatches Irwanto (2022), few systematically analyze the underlying factors driving graduates toward public service versus entrepreneurship, or examine how regional characteristics shape these preferences. This gap is particularly critical in peripheral regions like Aceh, where traditional employment structures and limited entrepreneurial ecosystems may fundamentally shape career trajectories differently than in urban centers.

In the East Coast of Aceh—which includes East Aceh District, Aceh Tamiang District, and Langsa City—vocational education is crucial for regional development. The area has significant potential for growth in industries such as agriculture, energy, and natural resources (BPS Kabupaten Aceh Timur, 2023; Nurlina et al., 2019). However, effective planning is necessary to ensure vocational education aligns with local economic needs. Strategic regional development plans must integrate economic policies with social and environmental considerations to promote sustainable growth (Lubis et al., 2024).

The challenges vocational graduates face in securing employment in Aceh are largely due to mismatches between their training and local industry requirements. Many graduates are not fully equipped to meet specific labor market demands, hampering their employability (Irwanto, 2022; Wicaksana et al., 2013). Vocational education development planning must therefore consider the region's unique characteristics, including resource and industry distribution (Billett, 2011; Nurlina et al., 2019).

When effectively planned and executed, vocational education can address these challenges by preparing graduates to engage with the region's leading industries. A focus on local resource utilization is key, ensuring graduates receive training in fields relevant to the regional economy. This also involves fostering entrepreneurship among graduates, which could provide solutions to limited formal job opportunities by enabling self-employment (Weng et al., 2022). Research demonstrates that integrating entrepreneurial education into vocational curricula significantly enhances graduates' capacity for innovation and self-employment (Weng et al., 2022; Nabi et al., 2017).

The integration of local economic potential into vocational education curricula can strengthen regional economies [18]. Planning for regional development requires not only effective educational strategies but also institutional frameworks supporting education system management and financing (Hariram et al., 2023). These frameworks must address both internal factors such as natural resources and external opportunities, ensuring vocational graduates are adequately prepared for local labor market challenges.

Despite these recognized needs, empirical evidence on vocational graduates' actual career pathways in regions with limited private-sector growth remains scarce. Understanding the factors that influence graduates to choose higher education and civil service over entrepreneurship—and the relative strength of these influences—is essential for designing effective interventions. This study addresses this gap by providing quantitative evidence on career pathway preferences and their determinants in a specific regional context.

This study examines how vocational high schools in the East Coast of Aceh align with local economic opportunities. By identifying factors influencing vocational graduates' career pathways, this research proposes strategies enhancing vocational education outcomes and contributing to regional economic growth. Ultimately, this research supports development of policies and educational reforms improving vocational graduates' employability and fostering entrepreneurship, contributing to broader discourses on vocational education's role in regional development and labor market alignment in contexts characterized by limited private-sector opportunities (Lubis, 2024; Maurer et al., 2015).

## **2. METHODS**

### **2.1 Research Area**

This study was conducted in the East Coast Region of Aceh, encompassing East Aceh District, Aceh Tamiang District, and Langsa City. These areas were selected due to their significant industrial growth potential in sectors such as agriculture, energy, and natural resources. Vocational high schools in these regions are crucial for regional development, making this an ideal area for studying factors influencing vocational graduates' educational and career choices. The region represents a typical context of limited private-sector growth with strong public-sector employment traditions, providing valuable insights for similar peripheral regions.

### **2.2 Research Design**

This research utilized a quantitative approach to analyze factors influencing vocational high school graduates' decisions to continue their education or pursue careers in public service or entrepreneurship. Simple Linear Regression analysis was employed to examine relationships between the number of vocational graduates and their career pathways (higher education, public service, entrepreneurship). This method was selected because it allows identification of the strength and direction of relationships between independent and dependent variables.

While simple linear regression provides initial insights into these relationships, we acknowledge that career decisions are influenced by multiple factors. Future research should employ more advanced statistical techniques, such as multiple regression analysis or path analysis, to address confounding variables including family socioeconomic status, gender, academic performance, access to information, and regional economic conditions. Such approaches would provide more robust analysis of career pathway determinants and enable identification of specific intervention points for policy development.

### 2.3 Data Collection

Data were collected from both primary and secondary sources:

Primary data were gathered through structured questionnaires distributed to a sample of vocational high school graduates across the East Coast Region of Aceh. The questionnaires focused on demographic information, educational background, career preferences, and factors influencing their decisions. Informed consent was obtained from all participants prior to data collection, and participants were assured of confidentiality and anonymity. The study received ethical clearance from the Universitas Sumatera Utara Research Ethics Committee.

Secondary data were obtained from the Central Statistics Agency (BPS), vocational high schools, and regional educational offices. These data provided insights into the number of vocational graduates, unemployment rates, and local labor market trends.

A purposive sampling technique was used to select vocational schools with high graduation rates and diverse program offerings, ensuring a representative sample of graduates with varying educational and career interests.

### 2.4 Sample Size and Population

The study surveyed 81 vocational high school graduates from three districts. This sample size was determined based on the number of vocational high schools in the region and their respective graduation rates. Graduates from fields such as engineering, agriculture, and commerce were included to ensure diverse representation of educational backgrounds. While this sample provides valuable preliminary insights, we acknowledge that a larger sample would strengthen generalizability of findings and enable subgroup analyses.

### 2.5 Data Analysis

Collected data were analyzed using SPSS 26 to perform Simple Linear Regression. This statistical method identified relationships between:

- The number of vocational graduates (independent variable,  $X$ )
- Their choice to continue to higher education/public service or entrepreneurship (dependent variables,  $Y_1$  and  $Y_2$ )

The regression model is specified as:

$$Y = \beta_0 + \beta_1 X + \epsilon$$

Where:

- $Y$  represents vocational graduates' career choices (higher education/public service or entrepreneurship)
- $X$  represents the number of graduates
- $\beta_0$  is the constant (intercept)
- $\beta_1$  is the regression coefficient
- $\epsilon$  is the error term

Key assumptions of linear regression were examined, including:

- Linearity: Scatterplots confirmed linear relationships between variables
- Independence: Observations were independent (no repeated measures)
- Homoscedasticity: Residual plots indicated relatively constant variance
- Normality: Residuals approximated normal distribution (Kolmogorov-Smirnov test,  $p > 0.05$ )

While these assumptions were reasonably met, we acknowledge potential limitations including unmeasured confounders and restricted sample size, which may affect model precision. The analysis aimed to determine the direction and strength of relationships between the number of vocational graduates and their career outcomes. Pearson correlation analysis was also conducted to assess the strength of association between independent and dependent variables.

### 3. RESULTS AND DISCUSSIONS

#### 3.1 Correlation Between Vocational High School Graduates and Higher Education/Public Service ( $Y_1$ )

The Pearson correlation between the number of vocational high school graduates ( $X$ ) and those continuing to higher education, police, army, or civil service roles ( $Y_1$ ) is 0.924, as shown in Table 1. This represents a very strong positive correlation, indicating that as the number of vocational high school graduates increases, the number pursuing higher education or public service positions increases proportionally.

Table 1: Correlation Between  $X$  and  $Y_1$

| Statistic                        | Value |
|----------------------------------|-------|
| Pearson Correlation ( $Y_1, X$ ) | 0.924 |
| N                                | 81    |

The Simple Linear Regression analysis produced the following equation:

$$Y_1 = 0.15X + \beta_0$$

This equation shows that for every additional vocational high school graduate, approximately 15% pursue higher education or public service. The coefficient of determination ( $R^2 = 0.854$ ) suggests that 85.4% of variation in graduates' career choices toward higher education or public service can be explained by the number of vocational high school graduates, with other factors accounting for the remaining 14.6%.

The strong positive correlation and regression results demonstrate that higher education and public service roles are the overwhelmingly preferred career paths among vocational graduates in the East Coast of Aceh. This preference can be attributed to several interconnected factors rooted in the regional socioeconomic context:

**Job Security and Social Status:** Public service positions in Indonesia, particularly in peripheral regions like Aceh, are associated with permanent employment, pension benefits, and social prestige (Kristiansen & Pratikno, 2006). In contexts where private-sector opportunities are limited and economic uncertainty is high, the stability offered by civil service becomes particularly attractive (World Bank, 2020).

**Family Influence and Socioeconomic Mobility:** Family expectations play a critical role in career decisions. Parents often view higher education credentials and civil service positions as pathways to upward social mobility and financial security for their children (Irwanto, 2022). This aligns with cultural values that prioritize stable, respectable employment over entrepreneurial risk-taking.

**Regional Employment Structure:** The East Coast of Aceh's economy is characterized by limited private-sector development and significant public-sector presence, particularly in government services, education, and security forces (BPS Kabupaten Aceh Timur, 2023;

Nurlina et al., 2019). This structural reality shapes graduates' perceptions of viable career options.

These findings align with previous research on vocational education in peripheral regions. Studies demonstrate that in areas with underdeveloped private sectors, vocational graduates often view formal education and public employment as more accessible and reliable pathways than entrepreneurship (Irwanto, 2022; Ratnawati, 2019). The near-perfect correlation (0.924) observed in this study underscores the depth of this preference pattern in Aceh, suggesting deeply embedded structural and cultural factors shaping career decisions.

### 3.2 Correlation Between Vocational Graduates and Entrepreneurship ( $Y_2$ )

The correlation between vocational high school graduates ( $X$ ) and those pursuing entrepreneurship ( $Y_2$ ) is 0.566, indicating a moderate positive correlation (Table 2). While this relationship is statistically significant, it is noticeably weaker than the correlation with higher education and public service, suggesting that substantially fewer graduates are inclined toward entrepreneurship.

Table 2: Correlation Between  $X$  and  $Y_2$

| Statistic                        | Value |
|----------------------------------|-------|
| Pearson Correlation ( $Y_2, X$ ) | 0.566 |
| N                                | 81    |

The regression model for entrepreneurship is:

$$Y_2 = 0.03X + \beta_0$$

This shows that for every additional vocational high school graduate, only 3% opt to pursue entrepreneurship. The coefficient of determination ( $R^2 = 0.5445$ ) indicates that 54.45% of variance in graduates' choice of entrepreneurship can be explained by the number of vocational graduates, with 45.55% attributed to other unmeasured factors.

The substantially weaker correlation (0.566 vs. 0.924) and lower regression coefficient (0.03 vs. 0.15) reveal a significant entrepreneurial gap among vocational graduates in the East Coast of Aceh. This gap reflects multiple intersecting barriers:

**Limited Access to Startup Capital:** Entrepreneurship requires initial capital investment, which many recent graduates lack. In regions with underdeveloped microfinance infrastructure and limited family wealth, accessing startup funding becomes a critical barrier (Bruton et al., 2015; Beck & Demircuc-Kunt, 2006). Unlike salaried employment, entrepreneurship demands upfront financial risk that many graduates cannot afford.

**Insufficient Entrepreneurial Education:** Current vocational curricula in Aceh emphasize technical skills for employment rather than business management, financial literacy, and entrepreneurial competencies (Weng et al., 2022; Fayolle & Gailly, 2015 ). Graduates report feeling unprepared to develop business plans, manage finances, or navigate regulatory requirements for business establishment.

**Lack of Mentorship and Support Networks:** Successful entrepreneurship often depends on mentorship from experienced business owners and access to supportive networks (St-Jean & Audet, 2012; Bosma et al., 2012). In the East Coast of Aceh, limited entrepreneurial ecosystems mean graduates have few role models or mentors to guide business development. The absence of business incubators, accelerators, or formal mentorship programs exacerbates this challenge.

**Perceived Risks and Uncertainty:** Entrepreneurship is inherently uncertain, with no guarantee of income stability. For graduates from families with limited financial buffers, the risk of business failure is perceived as unacceptably high compared to the guaranteed



salary of public service employment (Lerner et al., 2015). Cultural factors that stigmatize business failure further discourage entrepreneurial attempts.

**Regional Market Limitations:** The East Coast of Aceh's relatively small market size and limited consumer purchasing power constrain entrepreneurial opportunities. Graduates perceive limited demand for new products or services, reducing entrepreneurial attractiveness (BPS Kabupaten Aceh Timur, 2023; Nurlina et al., 2019).

These findings contribute to broader literature on vocational education and entrepreneurship in developing regions. Research consistently demonstrates that vocational graduates' entrepreneurial intentions are shaped not only by individual characteristics but also by institutional support, access to resources, and regional economic conditions (Nabi et al., 2017; ILO, 2020). The moderate correlation (0.566) suggests that while some relationship exists between vocational training and entrepreneurship, substantial barriers prevent this pathway from becoming a primary choice.

The 31-percentage-point gap in explained variance between public service (85.4%) and entrepreneurship (54.45%) pathways indicates that entrepreneurial decisions are influenced by a wider range of unmeasured factors—likely including family financial resources, risk tolerance, access to business networks, and entrepreneurial self-efficacy—than decisions to pursue formal employment or higher education.

### 3.3 Discussion

#### Comparative Analysis and Policy Implications

The stark contrast between career pathway preferences—with a Pearson correlation of 0.924 for higher education/public service versus 0.566 for entrepreneurship—reveals a systematic bias in vocational graduates' career trajectories in the East Coast of Aceh. This bias has significant implications for regional economic development and labor market dynamics.

#### Alignment with Regional Development Needs

While the region has identified agriculture, energy, and natural resources as growth sectors (BPS Kabupaten Aceh Timur, 2023; Nurlina et al., 2019), these industries increasingly require entrepreneurial innovation and private-sector development. The strong preference for public service employment creates a potential mismatch: vocational education produces graduates oriented toward formal employment in a region that needs entrepreneurial dynamism to activate its economic potential.

#### Sustainability of Public Service Absorption

The public sector's capacity to absorb vocational graduates is inherently limited. With 85.4% of career choice variance explained by public service preference, continued growth in vocational graduate numbers without corresponding expansion of public-sector positions risks increasing educated unemployment (ILO, 2020). This trend is already observable in Indonesia, where competition for civil service positions has intensified (Manning & Roesad, 2007).

**Entrepreneurship as Economic Solution:** Entrepreneurship offers a potential solution to limited formal employment opportunities by enabling graduates to create their own jobs and potentially employ others (Weng et al., 2022; Shane & Venkataraman, 2000). However, realizing this potential requires systematic interventions addressing the identified barriers.

**Implications for Vocational Curriculum Reform:** The findings underscore urgent need for curriculum reform that balances technical skill development with entrepreneurial competencies. Effective vocational education in the 21st century must prepare graduates not only for employment but also for self-employment and business creation (Nabi et al., 2017; Bacigalupo et al., 2016). This includes integrating modules on:

- Business planning and financial management
- Marketing and customer relationship management

- Legal and regulatory compliance for business establishment
- Innovation and opportunity recognition
- Risk management and resilience building

### **Need for Entrepreneurial Ecosystem Development**

Beyond curriculum reform, fostering entrepreneurship requires development of supportive ecosystems including:

- Microfinance institutions and startup funding mechanisms tailored to youth entrepreneurs
- Business incubators and co-working spaces providing infrastructure and mentorship
- Partnerships between vocational schools and local businesses for apprenticeships and mentoring
- Entrepreneurship competitions and startup support programs
- Regulatory simplification for small business registration and operation

### **Balancing Multiple Pathways**

While promoting entrepreneurship is critical, the strong preference for higher education and public service should not be dismissed. These pathways remain valid and contribute to regional development through educated civil servants and professionals. The challenge is to diversify career options rather than replace one pathway with another. Effective policy should support multiple trajectories while addressing barriers that artificially constrain entrepreneurial choices.

These findings contribute to scholarly discourse on vocational education's role in regional development by demonstrating that technical skill provision alone is insufficient. Vocational education must be embedded within broader economic development strategies that create enabling environments for diverse career pathways (Tripney et al., 2013; Allais, 2012). In contexts characterized by limited private-sector growth, intentional policy interventions are required to counterbalance structural factors that channel graduates disproportionately toward public employment.

## **4. CONCLUSION AND RECOMMENDATIONS**

### **4.1 Conclusion**

This study analyzed career pathways of vocational high school graduates in the East Coast Region of Aceh, focusing on their choices to pursue higher education, public service, or entrepreneurship. The findings provide important empirical evidence on career pathway preferences and their implications for vocational education policy and regional development.

The analysis revealed a very strong correlation (Pearson correlation 0.924,  $R^2 = 0.854$ ) between the number of graduates and their pursuit of higher education or public service, indicating that 85.4% of career choice variance toward these pathways can be explained by vocational graduate numbers. In stark contrast, the correlation with entrepreneurship was substantially weaker (Pearson correlation 0.566,  $R^2 = 0.5445$ ), with only 54.45% of entrepreneurial choice variance explained by graduate numbers. This 31-percentage-point gap in explained variance underscores a systematic bias toward formal employment and public service.

The strong preference for higher education and public service stems from multiple intersecting factors including perceived job security, social prestige, family influence, and desire for socioeconomic mobility. In a regional context characterized by limited private-sector opportunities and strong public-sector presence, these pathways are viewed as



more reliable and socially acceptable than entrepreneurship. However, this preference pattern raises sustainability concerns, as public-sector capacity to absorb graduates is inherently limited, potentially creating educated unemployment as vocational graduate numbers increase.

The significantly weaker entrepreneurial interest reflects critical barriers including lack of access to startup capital, insufficient entrepreneurial training in vocational curricula, absence of mentorship and support networks, perceived risks of business failure, and limited regional market opportunities. These barriers must be systematically addressed to diversify vocational graduates' career options and support regional economic development.

The study contributes to scholarly discourse on vocational education and regional development by demonstrating that vocational training alone is insufficient to promote entrepreneurship in contexts with limited private-sector growth. Technical skill provision must be complemented by entrepreneurial competency development, access to financial resources, mentorship programs, and supportive regulatory environments. Policymakers must recognize that career pathway preferences are shaped by structural factors requiring systemic interventions rather than individual-level solutions.

#### 4.2 Recommendations

1. Curriculum Reform: Integrate entrepreneurship education, business management, and financial literacy into vocational curricula alongside technical skills training
2. Entrepreneurial Ecosystem Development: Establish business incubators, mentorship programs, and startup funding mechanisms specifically for vocational graduates
3. Public-Private Partnerships: Strengthen collaboration between vocational schools and local businesses for apprenticeships, mentoring, and business development support
4. Access to Capital: Develop microfinance schemes and youth entrepreneurship funds with favorable terms for recent vocational graduates
5. Regulatory Simplification: Streamline business registration and licensing processes to reduce barriers to entrepreneurship
6. Diversified Career Guidance: Provide comprehensive career counseling exposing students to multiple pathways and connecting them with entrepreneurial role models

By addressing these recommendations, vocational education in the East Coast of Aceh can better support diverse career pathways, improve graduate employability, reduce unemployment, and contribute to sustainable regional economic development aligned with SDG targets for quality education and decent work.

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