

Feasibility Study on The Construction of A Public Vocational High School in Batam City

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ABSTRACT

This study aims to examine the feasibility of the development of State Vocational High Schools (SMK) in Batam City through a multi-aspect analysis approach that includes market and demand aspects, social impact, linkage with the Business and Industrial World (DUDI), and legality aspects. The methodology used was a descriptive-evaluative quantitative approach with primary data collection through a structured questionnaire involving three groups of respondents: (1) parents/guardians of junior high school students in Bengkong District (96 respondents) and Batu Aji District (96 respondents), (2) the community around the location (105 respondents in Bengkong and 96 respondents in Batu Aji), and (3) DUDI partners as many as 76 companies. The final eligibility decision was determined using a Weighted Scoring Model with weights: Market Aspects (30%), DUDI (30%), Social (20%), and Legal (20%). The results of the study showed that the Bengkong area received a composite score of 4.11 (Feasible category) and the Batu Aji area received a score of 4.22 (Very Feasible category). The DUDI survey revealed the actual recruitment needs of 4,998 vocational school graduates per year with a projection of 12,517 people in the next 3-5 years. Priority areas of expertise include Mechanical Engineering (3.91), Electronics Engineering (3.78), Accounting (3.71), Electrical Engineering (3.68), and TKJ (3.64). Community support reached 93.33% in Bengkong and 92.7% in Batu Aji. The research concludes that the construction of SMKN in Batam City is FEASIBLE and recommends that preparations be made immediately for the establishment with a skill program tailored to the industrial characteristics of each region.

INTRODUCTION

Education plays an important role in efforts to improve the quality of human resources who are able to compete in the global era (Savitri et al., 2024). Within the framework of the national education system as stipulated in Law Number 20 of 2003 concerning the National Education System, vocational education at the secondary level is directed to equip students with the ability to work according to certain fields of expertise. The existence of Vocational High Schools (SMK) is very important as an institution that prepares a competent, skilled, and ready middle-level workforce to enter the world of work.

The increasingly dynamic development of the industrial world requires a workforce that not only has theoretical knowledge, but also practical skills and a professional attitude. The government continues to encourage the strengthening of vocational education through various

strategic regulations, including Presidential Instruction Number 9 of 2016 concerning the Revitalization of Vocational Schools and Presidential Regulation Number 68 of 2022 concerning the Revitalization of Vocational Education. Vocational schools are designed with a needs-based approach to the business world and the industrial world (DUDI) so that graduates are expected to have relevant competencies and be able to adapt to technological developments and job market demands (Djojonegoro, 1998).

Batam City as an industrial and free trade zone (Free Trade Zone) is experiencing rapid growth that requires skilled labor in a sustainable manner (Agustianto et al., 2024; Cekindo, 2025). By 2025, the population of Batam City will have reached around 1.296 million people with economic growth of 6.69% in 2024 (BPS Batam City, 2025). Batam's economic structure, which is dominated by the processing industry sector (56.83% of GDP), reflects the large need for a large middle-level workforce, especially in the fields of engineering and administration (Agustianto et al., 2024; Nugroho et al., 2023; Husnayetti et al., 2024). Of the 66 vocational schools spread across Batam City in the 2024/2025 school year, only 12 have state status while the other 54 are private (BPS Batam City, 2025; Sari & Jasiah, 2025). Geographically, Bengkong District does not have a single State Vocational School and Batu Aji District only has two State Vocational Schools, reflecting a significant inequality in access to public vocational education that needs to be addressed immediately (Sari & Jasiah, 2025; Khonsa et al., 2025; Yusuf & Mustofa, 2020), especially in areas that are rapidly developing and have direct proximity to industrial areas (Agustianto et al., 2024; Wang et al., 2021).

The novelty of this research lies in several key contributions. First, this study provides the first comprehensive multi-aspect feasibility analysis for public vocational school construction in Batam City using a Weighted Scoring Model with expert-determined weights (Market 30%, DUDI 30%, Social 20%, Legal 20%) (Demetracopoulou et al., 2025; Wang et al., 2021). Second, the research integrates data from 469 respondents across three stakeholder groups (parents, community, industry), providing triangulated insights on feasibility (Wang et al., 2021; Husnayetti et al., 2024). Third, the study quantifies industry demand by specific expertise areas (Mechanical Engineering 3.91, Electronics Engineering 3.78, Accounting 3.71, Electrical Engineering 3.68, TKJ 3.64) and projects future workforce needs over 3-5 years (Mahmud et al., 2024; Wibowo & Sudira, 2024). Fourth, the research compares two potential locations (Bengkong and Batu Aji) with composite feasibility scores (4.11 vs 4.22), providing decision-makers with comparative analysis (Demetracopoulou et al., 2025; Wang et al., 2021). Fifth, the study identifies specific soft skill gaps in current vocational graduates' technical capabilities lacking (51.32%), weak communication (50%), lack of initiative (48.68%) providing targeted recommendations for curriculum design in new schools (Putra et al., 2025; Sulistyawati & Mulyono, 2024).

The general purpose of this study is to examine the feasibility of building a new State Vocational School in Batam from various aspects comprehensively and objectively. In particular, the study aims to: (1) analyze the demand and supply of vocational education in Batam City; (2) identify priority expertise programs for each location based on industry needs; (3) to assess technical, operational, and location feasibility; (4) analyze social impacts and opportunities for cooperation with DUDI; and (5) formulate recommendations and feasibility decisions that can be used as a basis for policy decision-making.

Theoretically, this study adds to the literature on the feasibility study of vocational education in Indonesia and enriches the study of the link and match of vocational schools with industry. Practically, the results of the study provide benefits to: (a) the Riau Islands Provincial Government in making strategic decisions on the establishment of new State Vocational Schools; (b) the Provincial Education Office in development planning and budgeting; (c) the people of Bengkong and Batu Aji Districts in accessing quality state vocational education; and (d) DUDI partners in obtaining certainty of the supply of skilled labor in the future.

METHOD

Research Design

This feasibility study used a descriptive-evaluative quantitative approach with the Multi-Aspect Feasibility Analysis method. The quantitative approach was chosen because the study requires numerically measurable and statistically analyzed data to produce objective and accountable feasibility conclusions. The descriptive dimension aims to describe the actual conditions of the various aspects studied, including the demographic characteristics of the respondents, public perception, industry needs, and regulatory conditions. The evaluative dimension is used to assess the extent to which the Batam State Vocational School development plan meets the eligibility criteria that have been set. Data sources include primary data from the field and secondary data from official publications of BPS, the Education Office, and relevant academic literature.

Location and Time of the Research

The research was carried out in Batam City, Riau Islands Province, with two geographical focus points: (1) the Tanjung Buntung area, Bengkong District; and (2) Tanjung Unsang Village, Batu Aji District. The selection of the two locations was based on the direction of the regional vocational education development policy and the results of a preliminary study on the absence of State Vocational Schools in the two rapidly developing areas. Primary data collection will be carried out from February to March 2026.

Population, Sample, and Sampling Techniques

This study involved three groups of respondents using purposive sampling techniques based on domicile criteria and relevance to the research object. The distribution of respondents is presented in Table 1 below.

Table 1. Distribution of Research Respondents

Yes	Respondent Group	Location	Quantity
1	Parents/guardians of junior high school students	Bengkong District (Tanjung Buntung)	96
2	Parents/guardians of junior high school students	Batu Aji District (Tanjung Uncang)	96
3	The community around the location	Bengkong District	105
4	The community around the location	Batu Aji District (Tanjung Uncang)	96
5	DUDI Partners	Batam City	76
	Total		469

Source: Research primary data (2026)

Data Collection Instruments and Techniques

The research used four types of instruments: (1) a questionnaire for parents/guardians of students that measured their children's interest and plans to continue their children to vocational school, preference for skill programs, and financial ability; (2) DUDI questionnaire to identify labor needs, priority competencies, and forms of cooperation; (3) social impact questionnaires to explore people's perceptions, hopes, and concerns; and (4) field observation forms to assess the physical condition and accessibility of the location. The measurement uses a Likert scale of 1–5, where the average value below 3.00 is categorized as low/negative, 3.00–3.99 is categorized as moderate/moderate/moderate, and 4.00 and above is categorized as high/positive (Sugiyono, 2019). Data collection was carried out through direct questionnaire surveys, literature studies, field observations, and documentation studies.

Data Analysis Techniques

Data analysis was carried out in stages using: (1) quantitative descriptive analysis for frequency, percentage, and mean value distributions using SPSS software and Microsoft Excel; (2) gap analysis to identify the difference between actual conditions and expected conditions; (3) projection analysis using trend analysis; and (4) Weighted Scoring Model for final eligibility decision-making. Eligibility categories were determined using an interval scale: 1.00–1.80 (very unfeasible), 1.81–2.60 (not eligible), 2.61–3.40 (moderately eligible), 3.41–4.20 (eligible), and 4.21–5.00 (highly eligible).

Profile of Batam City

Batam City is one of the strategic cities in the Riau Islands Province which has a very important geographical position in the regional, national, and international contexts. Its location on international shipping lanes and its proximity to Singapore and Malaysia make Batam one of the main nodes of economic growth in the western region of Indonesia. This position provides comparative advantages for Batam in industrial development, trade, logistics, and investment. As an archipelagic area, Batam City has distinctive spatial characteristics, consisting of land and water areas with regional development patterns that require an educational planning approach that considers equal access.

Table 2. Main Demographic and Economic Indicators of Batam City

Indicator	Data
Total Population (2024)	1,276,930 inhabitants
Total Population (2025)	1,296,960 inhabitants
ADHB PDRB (2023)	IDR 216.10 trillion
ADHB PDRB (2024)	IDR 233.05 trillion
Economic Growth (2024)	6,69%
Open Unemployment Rate (2022)	9,56%
Open Unemployment Rate (2023)	8,14%
Open Unemployment Rate (2024)	7,68%

Source: BPS Batam City, Batam City in 2025 figures.

The development of a relatively high population is influenced by Batam's role as an industrial centre that attracts the mobility of people from various regions. The increase in the

population has a direct impact on the increasing need for educational units, especially at the secondary education level, not only in the form of adding schools, but also increasing capacity and equitable distribution of services.

Economic Structure of Batam City

The economic structure of Batam City is dominated by the processing industry sector which will contribute 56.83% to GDP in 2024. This dominance shows that Batam is a city that has a very strong economic orientation in the production and manufacturing sectors, so the needs of middle-level workers from vocational schools are very relevant and strategic. Batam City also has industrial areas spread across a number of strategic areas such as Batu Aji, Sagulung, Sekupang, Batam Kota, Batu Ampar, Mukakuning, and Kabil.

Table 3. Economic Structure of Batam City by Dominant Business Field (2024)

Business Field Sector	Contribution to GDP
Processing industry	56,83%
Construction	20,41%
Large/retail trade; Vehicle Repair	6,33%
Financial services and insurance	3,46%
Information and communication	2,84%
Transportation and warehousing	1,92%
Accommodation and dining	1,88%

Source: BPS Batam City, Batam City in 2025 figures.

Condition of Vocational Education in Batam City

The existing condition of vocational education in Batam City shows that there is a significant gap in services. Of the 66 vocational schools spread across the 2024/2025 school year, only 12 have state status (18.18%) and 54 others are private (81.82%). Geographically, Bengkong District does not have a single State Vocational School, and Batu Aji District only has two State Vocational Schools. Participation data shows that there is still significant room for increased access to vocational education in these developing regions.

Table 4. Condition of State Vocational Schools in the Research Target Area

Districts	Number of State Vocational Schools	Status	Implications
Squirt	0	Not available	Need to be built immediately
Batu Aji	2	Limited	There is a need for additional capacity
Batam City (total)	12 of 66	18.18% of the state	Ratio below ideal standard

Source: Riau Islands Provincial Education Office (2025).

RESULTS AND DISCUSSION

A. Market and Demand Aspect Analysis

1. Bengkong Region (Tanjung Buntung)

A survey of 96 respondents of parents/guardians of junior high school students in Tanjung Buntung, Bengkong District, showed that the profile dominated by the productive age group of 36 to 55 years old was 83%. The education level of the respondents, the majority of whom are at least high school/vocational school, indicates a good awareness of the importance of skills-based continuing education. As many as 58.3% of respondents are domiciled in this region, indicating the potential for a large catchment area. Economic conditions tend to be lower middle with 44.8% earning Rp 3-5 million per month and the majority expect very affordable or free education fees.

Table 5. Distribution of Respondents Based on Children's Education Plan in Bengkong District

Children's Education Plan	Frequency	Percentage (%)
Choosing a Vocational School	32	33,3%
Choosing a high school	33	34,4%
Not yet determined (potential)	31	32,3%
Total	96	100%

Source: Primary data of the study (2026).

The most in-demand skill programs in Bengkong are Accounting (16%), Mechanical Engineering (10.8%), and Computer and Network Engineering/TKJ (9.4%), reflecting the diverse orientation of the community between the business and engineering sectors. The 32.3% segment that has not yet made a choice is a potential share that can be converted through targeted socialization.

2. Batu Aji Region (Tanjung Uncang)

In the Batu Aji District location, the demand level is much higher and concentrated. As many as 63.5% of respondents' parents plan to send their children to vocational schools, almost double that of the Bengkong area, while only 7.3% choose high school. The dominance of respondents' profiles as private employees in the industrial sector reached 59%, reflecting the community's direct understanding of the need for technical competencies in their work environment.

Table 6. Distribution of Respondents Based on Children's Education Plan in Batu Aji District

Children's Education Plan	Frequency	Percentage (%)
Choosing a Vocational School	61	63,5%
Choosing a high school	7	7,3%
Not yet determined	28	29,2%
Total	96	100%

Source: Primary data of the study (2026).

The expertise programs in demand at Batu Aji are very technically oriented: Mechanical Engineering dominates (17.7%), followed by Electronics Engineering (14.6%) and TKJ (11.1%). These three engineering fields together accounted for 43.4% of the total choice of respondents, reflecting the character of the region close to the manufacturing industrial estate. Table 7 presents a comparison of the interest of the expertise program between the two regions.

Table 7. Comparison of Expertise Program Interests in the Two Regions

Membership Programs	Squirt (%)	Batu Aji (%)
Machinery/Welding Engineering	10,8	17,7
Electronics Engineering	< 10	14,6
Computer & Network Engineering	9,4	11,1
Accounting	16,0	< 10
Others	≥ 53.8	≥ 46.6

Source: Primary data of the study (2026).

B. Social Impact Aspect Analysis

The social impact survey produced very positive findings in both regions. Around Bengkulu, public support reached 93.33% without a single respondent firmly rejecting it. Around the Batu Aji location, support reached 92.7% with a higher average perception value in the range of 4.00 to 4.22. Table 8 presents a recapitulation of the results of social impact analysis in both regions.

Table 8. Comparison of Social Impact Analysis Results in the Two Regions

Social Impact Indicators	Squirt	Batu Aji
Level of community support	93,33%	92,7%
Average values of perception and attitude	3,85–3,97	4,00–4,22
Perception category	Quite Positive–Positive	Good–Very Good
Negative impact concerns (scale 1-5)	2,06–2,90	Low
Never been involved in deliberation	~50%	76,1%
Want to be involved in deliberation	Majority	46,9%

Source: Primary data of the study (2026).

Traffic congestion during school and school hours is the most cited concern in both regions and needs to be anticipated through planned traffic management. The high proportion of people who have never been involved in development deliberations but want to be involved indicates the urgency for the government to open a more inclusive and accessible deliberation forum.

C. Analysis of Absorption and Cooperation of DUDI

1. DUDI Respondent Profile

A total of 76 companies participated in the survey with a composition based on the scale of business dominated by large businesses (≥250 employees) of 50%, medium enterprises 25%, and small enterprises of 18.42%. More than half of the respondents (43.42%) were foreign private companies or joint ventures, reflecting Batam's character as a free trade zone that

attracts foreign investment from Singapore, Malaysia, and other Asian countries. The manufacturing sector (including electronics manufacturing, CNC fabrication, and plastic manufacture) dominated with more than 25 companies, followed by the oil and gas, shipbuilding, and construction sectors.

Table 9. Distribution of DUDI Respondents Based on Scale and Ownership Status

Categories	Scale/Status	Quantity	Percentage
Enterprise Scale	Large Business (≥ 250 employees)	38	50,00%
	Medium Business (50-249 employees)	19	25,00%
	Small Business (10-49 employees)	14	18,42%
	Micro Business (1-9 employees)	5	6,58%
Ownership Status	Foreign Private/Joint Venture	33	43,42%
	National Private	23	30,26%
	Regional/Local Companies	15	19,74%
	BUMN/BUMD	5	6,58%

Source: Primary data of the study (2026).

2. Labor Needs of Vocational School Graduates

The demand for vocational school graduates in Batam is very significant. Of the 76 companies surveyed, the number of actual recruitments over the past year reached around 4,998 vocational school graduates. The projected need in the next 3-5 years reaches around 12,517 people, almost 2.5 times the current realization. Several large companies project a large need: PT Giken Precision Indonesia (3,000 graduates), PT Epson (1,500 people), Shimano Batam (1,000 people), and PT Infineon Technologies (600 people). As many as 80.2% of respondent companies have actively recruited vocational school graduates on a regular basis.

Table 10. Frequency of Recruitment of Vocational School Graduates by DUDI Partners

Recruitment Frequency	Quantity	Percentage
Frequent (>10 people in the last 3 years)	41	53,95%
Sometimes (1-10 people in 3 years)	20	26,32%
Rare (<5 people in the last 3 years)	11	14,47%
Never	4	5,26%
Total	76	100%

Source: Primary data of the study (2026).

3. Priority of Expertise and Competence

Respondents were asked to assess 13 areas of expertise of vocational schools using a scale of 1-5. The results of the assessment show that the engineering fields dominate the needs of the Batam industry. Mechanical Engineering occupies the top position with an average of 3.91, followed by Electronics Engineering (3.78), Accounting (3.71), Electrical Engineering (3.68), and TKJ (3.64). The inclusion of Accounting in the top three shows that administrative and financial skills are also needed across sectors.

Table 11. Rating of Needs in the Field of Vocational Expertise (Scale 1-5)

Yes	Vocational Expertise Field	Average (1-5)	Priorities
1	Mechanical Engineering (Operator, Technician, Welder)	3,91	Very High
2	Electronics Engineering (Technician, Maintenance)	3,78	Very High
3	Accounting (Accounting Staff, Financial Admin)	3,71	Very High
4	Electrical Engineering (Electrical Technician, Installation)	3,68	Very High
5	Computer & Network Engineering (IT Support)	3,64	Height
6	Business & Marketing	3,54	Height
7	Automotive Engineering	3,39	Height
8	Software Engineering	3,38	Height
9	Multimedia/Graphic Design	3,16	Medium
10	Fashion / Hospitality / Tourism / Fashion	1,76–1,96	Low

Source: Primary data of the study (2026).

All soft skills indicators get an average score above 4.6 which is in the very important category. Discipline and punctuality (4.84) occupy the top position, followed by professional attitude and work ethic (4.82), as well as teamwork ability (4.80). These findings consistently show that industry players value character, discipline, and work ethic as an uncompromising foundation for prospective vocational school graduates.

4. Graduate Evaluation and Cooperation Opportunities

As many as 53.9% of respondents stated that they were satisfied or very satisfied with the performance of vocational school graduates, while 43.4% stated that they were quite satisfied. Only 2.6% were less satisfied. The high percentage of satisfied people means that there is still significant room for improvement, especially in overcoming the gap in technical competence and soft skills. The three main shortcomings that are most often mentioned are: lack of technical skills (51.3%), weak communication skills (50%), and lack of initiative and proactivity (48.7%).

In terms of cooperation opportunities, the admission of street vendors/internships is the most accepted form (77.6%), followed by the recruitment of vocational school graduates (52.6%). As many as 25% of companies are willing to make formal recruitment commitments (MoU). The duration of street vendors of 4-6 months was the most chosen (42.1%). For the salary of fresh graduates of vocational schools, most offer IDR 5,000,001–IDR 6,000,000 per month (38.2%), even some companies in the oil and gas sector offer more than IDR 6,000,000 per month.

Table 12. Forms of Cooperation That the Industry Is Willing to Do with Vocational Schools

Yes	Forms of Cooperation	Frequency	% Respondents
1	Accepting street vendor/internship students	59	77,63%
2	Recruitment of vocational school graduates	40	52,63%
3	Industrial visits for vocational school students	12	15,79%
4	Job fair & career expo	9	11,84%
5	Guest lecturer from industry	8	10,53%
6	Providing competency certifications	5	6,58%
7	Upskilling teacher training	4	5,26%
8	Teaching factory/industrial class	3	3,95%
9	Donation of practice equipment/machinery	1	1,32%
10	Scholarships for outstanding students	1	1,32%

Source: Primary data of the study (2026).

5. Industry Trends and Business Projections

Data Analytics is the most mentioned technology that will grow in the next 5 years (51.3%), followed by Automation & Robotics (46.1%), IoT (32.9%), and AI/Machine Learning (28.9%). The implications for vocational curricula are the need to integrate digital literacy and a basic understanding of automation, IoT, and data analytics across areas of expertise. The majority of respondents (90.8%) project business growth in the next 5 years, of which 67.1% are growing steadily and 23.7% are growing rapidly, providing certainty that the needs of vocational school graduates will continue to grow sustainably.

D. Analysis of Legal Aspects

The analysis of the legality of the establishment of State Vocational Schools is based on the fulfilment of various groups of documents that form an interrelated and independent chain of legality. The first layer of documents that must be completed is the main legality document that confirms the legal status of the school (Governor's Decree, Establishment Permit, NPSN). The second layer is a planning document that proves the rationality of the establishment (Feasibility Study, RIPS, RKJM, RKT, Needs Analysis, School Distribution Map). The third layer is the legality document of the location and construction (Land Certificate, RTRW Suitability, Site Plan, Building Plan, PBG). The fourth layer is operational readiness documents (Decree of Principals and Teachers, Curriculum, Infrastructure, MoU DUDI).

By paying attention to all legal aspects, the legal position of the establishment of SMK Negeri in Batam is considered to be on the right track but not completely final. The Riau Islands Provincial Government has an initial basis in the form of an application for establishment and initial financing support. The measure of success of the current stage lies in the speed and order of the completion of basic documents according to the proper order of authority and stages.

A. Weighted Scoring Model Methodology

The final eligibility decision was determined using the Weighted Scoring Model as recommended by Triantaphyllou (2000). The weight of each aspect is determined based on expert judgment: Market & Demand Aspect (30%) as it is the main indicator of real demand; The DUDI aspect (30%) because vocational schools are highly dependent on relevance to the world of work; Social Aspect (20%) because it determines the level of acceptance and operational sustainability; and Legal Aspects (20%) which are administrative and can be completed gradually.

B. Scoring Results - Bengkong Region

Table 13. Scoring Multi-Aspect Qualification for the Bengkong Region

Yes	Aspects	Weight (%)	Score	Value Weight
1	Market & Demand	30%	4,2	1,26
2	Social	20%	4,0	0,80
3	DUDI	30%	4,3	1,29
4	Legal	20%	3,8	0,76
	Total	100%	-	4,11

Source: Results of research analysis (2026).

A total value of 4.11 shows that development in the Bengkong area is in the FEASIBLE category. The main strengths lie in the industrial (4.3) and demand aspects, while the relative weaknesses are only in the legal/administrative aspects (3.8) which are temporary and can be resolved through structured inter-agency coordination.

C. Scoring Results - Batu Aji Region

Table 14. Multi-Aspect Eligibility Scoring for the Batu Aji Region

Yes	Aspects	Weight (%)	Score	Value Weight
1	Market & Demand	30%	4,4	1,32
2	Social	20%	4,3	0,86
3	DUDI	30%	4,2	1,26
4	Legal	20%	3,9	0,78
	Total	100%	-	4,22

Source: Results of research analysis (2026).

The total value of 4.22 puts the Batu Aji area in the VERY FEASIBLE category, one level higher than the Bengkong area. The main advantages in terms of access and very high community needs (4.4) and strong social support (4.3) are the main driving factors.

D. Priority Expertise Program Recommendations

Table 15. Priority Recommendations for Vocational Expertise Programs

Yes	Membership Programs	Priorities	Basis of Consideration
1	Machinery/Welding Engineering	Home	Rating: 3.91; Manufacturing, Shipyard, Oil & Gas Needed
2	Electronics Engineering/Mechatronics	Home	Rating: 3.78; dominant in the EMS and electronics manufacturing industries
3	Electrical Engineering/Industrial Installation	Home	Rating: 3.68; high demand across industry sectors
4	Computer & Network Engineering	Home	Rating: 3.64; Relevant for the era of industrial digitalization
5	Accounting/Office Administration	Home	Rating: 3.71; needed across industry sectors
6	Automotive Engineering	Supporters	Rating: 3.39; Relevant for the transportation & heavy equipment industry
7	Software Engineering	Supporters	Rating: 3.38; Supporting industrial digital transformation
8	Building/Civil & Environmental Engineering	Special	Real needs but not yet available at SMK Batam

Source: Synthesis of DUDI survey data (2026).

A. Demographic Profile of Bengkong Survey Respondents

Understanding the demographic characteristics of respondents is the foundation for interpreting survey results contextually. In Tanjung Buntung, Bengkong District, the survey involved 96 respondents of parents/guardians of junior high school students with diverse profiles. The distribution by gender shows the dominance of women (68.8%) compared to men (31.3%), reflecting the tendency of housewives to be more active in responding to surveys related to children's education.

Table 16. Demographic Profile of Parents/Guardians of Respondents in Bengkong

Demographic Categories	Groups	Frequency	Percentage (%)
Gender	Male	30	31,3%
	Women	66	68,8%
Age	26–35 Years	6	6,3%
	36–45 Years (dominant)	44	45,8%
	46–55 years old	36	37,5%
	>56 years old	10	10,4%
Education	Junior High School	6	6,3%
	High School/Vocational School (Dominant)	68	70,8%

	Bachelor (S1)	21	21,9%
	Master/Doctoral	1	1,0%
Revenue/month	< IDR 3 million	22	22,9%
	IDR 3–5 million (dominant)	43	44,8%
	IDR 5–8 million	21	21,9%
	> IDR 8 million	10	10,4%

Source: Primary data of the study (2026).

The 36–55-year-old age group dominated with a total of 83.3%, reflecting the profile of parents who are in the active phase in considering further education for children. The education level of which the majority is at least high school/vocational school (92.7%) indicates a fairly good awareness of the importance of further education. The income profile shows that 44.8% are in the Rp 3-5 million/month group, strengthening the urgency of the presence of free State Vocational Schools.

B. Public Perception and Attitude towards the Development of Vocational Schools in Bengkulu

A social impact survey of 105 community respondents around the location of the SMK plan in Bengkulu revealed a very positive perception and attitude. Analysis using a Likert scale of 1-5 shows that the entire dimension of perception has an average of above 3.8. Public expectations of the positive impacts of development, concerns about negative impacts, and overall attitudes are summarized in the following table.

Table 17. Public Perception and Attitude to the Vocational School Development Plan in Bengkulu

Perception and Attitude Dimensions	Average (1-5)	Categories
Perception of the importance of State Vocational Schools in this region	3,97	Positive
Perception of the benefits of vocational schools for the surrounding community	3,95	Positive
Attitude towards the SMK development plan	3,92	Positive
Expectations for a positive economic impact	3,88	Quite Positive
Hope for the improvement of local human resources	3,95	Positive
Concerns about traffic congestion	2,90	Low
Concerns about noise	2,50	Low
Concerns about environmental impacts	2,06	Very Low

Source: Primary data of the study (2026).

These findings indicate that the people of Bengkulu have a mature and critical outlook strongly supporting development while identifying concrete issues that need to be mitigated. Traffic congestion is the highest concern (2.90 on a scale of 1-5) and needs to be anticipated from the planning stage. About 50% of respondents stated that they had never been involved in development deliberations but wanted to be involved, indicating that a structured and

inclusive public participation mechanism is needed to strengthen the social legitimacy of the project.

C. Demographic Profile of Batu Aji Survey Respondents

A survey of parents/guardians in Tanjung Uncang, Batu Aji District, also involved 96 respondents with a slightly different profile from Bengkong, reflecting the character of a more industrial area. The dominance of private employees in the industrial sector (59%) shows that respondents have direct experience working in an industrial environment, so their understanding of technical competency needs is deeper.

Table 18. Demographic Profile of Parents/Guardians of Respondents in Batu Aji

Demographic Categories	Groups	Frequency	Percentage (%)
Gender	Male	34	35,4%
	Women	62	64,6%
Jobs	Industrial Private Employees (dominant)	57	59,0%
	Self-employed	18	18,8%
	Housewives	13	13,5%
	Civil Servants/ASN	5	5,2%
	Others	3	3,5%
Revenue/month	< IDR 3 million	12	12,5%
	IDR 3–5 million	38	39,6%
	IDR 5–8 million (dominant)	35	36,5%
	> IDR 8 million	11	11,5%

Source: Primary data of the study (2026).

The income profile in Batu Aji is slightly higher than in Bengkong, with 36.5% in the Rp 5-8 million/month group, reflecting the dominance of industrial private employees with more competitive salaries. However, 52.1% of respondents are still in the income group below Rp 5 million/month, emphasizing that the existence of State Vocational Schools is still needed to ensure the affordability of education costs.

D. Analysis of Public Perception in Batu Aji

A social impact survey of 96 community respondents around the Batu Aji location showed even stronger support than Bengkong. The average value of perception and attitude was in the range of 4.00 to 4.22, in the category of Good to Very Good, indicating that the people of Batu Aji have higher expectations for the benefits of vocational school development.

Table 19. Distribution of Community Support for the Construction of Vocational Schools in Batu Aji

Categories Support	Frequency	Percentage (%)
Highly supportive	70	72,90%
Support	19	19,80%
Neutral	6	6,20%
Lack of support	1	1,00%
Total	96	100%

Source: Primary data of the study (2026).

As many as 72.9% of respondents stated that they were very supportive and 19.8% were supportive, so that the total positive support reached 92.7%. Only 1% were less supportive and no respondents strongly opposed. This high level of support reflects the very real need for State Vocational Schools in the Batu Aji area which have not been optimally served by state vocational education.

E. Gap Analysis of Current Vocational School Graduates

The gap analysis between the competencies expected by the industry and the actual conditions of current vocational school graduates shows a significant gap. This finding is one of the strong arguments that new vocational schools to be built in Batam need to be designed with a stronger orientation on meeting industry standards.

Table 20. Gaps/Shortcomings Found in Current Vocational School Graduates

Yes	Gaps/Shortcomings	Frequency	% DUDI Respondents
1	Technical capabilities are still lacking	39	51,32%
2	Weak communication skills	38	50,00%
3	Lack of initiative and procrastination	37	48,68%
4	Lack of discipline and professionalism	30	39,47%
5	Low problem-solving ability	27	35,53%
6	Not ready for the real world of work	19	25,00%
7	Irresponsible attitude	19	25,00%
8	Unfamiliar with the latest technology	9	11,84%
9	No significant shortcomings	11	14,47%

Source: Primary data of the study (2026).

An interesting paradox is that the three main deficiencies (technical capabilities, communication, and initiative) are precisely the industry's most prioritized aspects. This indicates a real gap between the current output of vocational education and industry expectations a finding that reinforces the urgency of designing new vocational schools with a more consistent link and match approach, a curriculum integrated with industry standards, and a more structured soft skills provision.

F. Technology Trends and Industry Projections

Table 21. Technology and Skill Trends in the Next 5 Years

Yes	Technology/Skills	Frequency	% Respondents
1	Data Analytics	39	51,32%
2	Automation & Robotics	35	46,05%
3	Internet of Things (IoT)	25	32,89%
4	Artificial Intelligence & Machine Learning	22	28,95%
5	Digital Marketing & E-Commerce	21	27,63%
6	3D Printing/Additive Manufacturing	18	23,68%
7	Cloud Computing	14	18,42%
8	Cybersecurity	9	11,84%
9	Renewable Energy	9	11,84%
10	Augmented/Virtual Reality (AR/VR)	4	5,26%

Source: Primary data of the study (2026).

These technological trends have significant curriculum implications. Industries in Batam not only need graduates who are technically skilled in conventional fields, but also graduates who have digital literacy, understand the basics of automation and IoT, and are able to adapt to the transformation of industry 4.0. The vocational schools to be built need to integrate digital literacy and a basic understanding of automation as competencies across areas of expertise.

Table 22. Projected Industrial Business Development in the Next 5 Years

Business Projections	Quantity	Percentage
Stable development (incremental increase in employees)	51	67,11%
Growing rapidly (adding more employees)	18	23,68%
Stagnant (number of employees relatively fixed)	5	6,58%
Unable to predict / Downward	2	2,63%
Total	76	100%

Source: Primary data of the study (2026).

The majority of respondents (90.79%) project business growth in the next 5 years, providing strong certainty that the needs of the workforce of vocational school graduates will continue to grow sustainably. This condition strengthens the urgency and relevance of the development of State Vocational Schools in Batam as a long-term investment in human resource development that is in line with industrial growth.

CONCLUSIONS

Based on the results of a comprehensive study using the Weighted Scoring Model method on four main aspects, the construction of a State Vocational High School in Batam City was declared FEASIBLE and VERY FEASIBLE to be realized. The Bengkong region received a

composite score of 4.11 (Feasible category) with strength in the DUDI and demand aspects, while the Batu Aji area received a score of 4.22 (Very Feasible category) with advantages in the aspects of access, community needs, and social support. Very strong social support reached 93.33% in Bengkong and 92.7% in Batu Aji; industrial needs that have proven to be large with a projection of 12,517 vocational school graduates needed in the next 3-5 years from 76 DUDI partners; and the ongoing legal framework makes the construction of SMKN in Batam not only feasible academically, but also urgent in policy. Based on the findings of this study, five priority steps are recommended as follows: (1) The Riau Islands Provincial Government through the Education Office immediately follows up on the preparation for the establishment of a new vocational school in Batam through the completion of the main legality documents as the foundation for implementation; (2) develop an industry-based education model from the beginning with a curriculum prepared with DUDI, a structured street vendor program of at least 4-6 months, and industry-standard workshop facilities; (3) implementing an inclusive education financing policy in accordance with the principles of free state vocational schools for students; (4) strengthening socialization to the community in a structured manner in both areas, especially in Batu Aji where more than 74% of the community does not have adequate information about development plans; and (5) establish expertise programs according to the characteristics of each region, namely Accounting, Mechanical Engineering, and TKJ for Bengkong, as well as Mechanical Engineering/Welding, Electronics Engineering, and Electrical Engineering for Batu Aji.

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