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Comparative Analysis of The High School Double Track Program and Vocational Education: Implications for Graduates' Work Readiness

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Abstract

This study examines the effectiveness of Indonesia's Double Track Program in Senior High Schools and Vocational Education in enhancing graduates' work readiness. Vocational High Schools (SMK) focus on industry-based technical skills, while the Double Track Program offers additional skills for students not pursuing higher education. Using a qualitative comparative case study at SMA Immanuel Batu, the research analyzes curriculum, learning methods, industry involvement, and graduate competencies. Findings indicate SMK graduates are better prepared for employment due to intensive industrial practice, whereas The High School Double Track Program graduates exhibit greater adaptability across job sectors, including entrepreneurship. However, challenges persist: SMK struggles to keep pace with industrial advancements, while The High School Double Track Program lacks sufficient industry engagement and practical training facilities. This study underscores the need for stronger collaboration between education and industry to improve graduate employability, advocating for more adaptive education policies aligned with job market demands.

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INTRODUCTION

In the era of globalization and the Industrial Revolution 4.0, the workforce demands graduates who possess not only academic knowledge but also technical skills readiness (World Economic Forum, 2024; OECD, 2023). Secondary education plays a crucial role in equipping students with the competencies necessary to meet these evolving job market requirements. In Indonesia, the Double Track programs in Senior High Schools and Vocational Education represent two significant pathways aimed at enhancing graduates' work readiness.

Amid the increasing complexity and dynamism of the world of work, education holds a strategic position in preparing competent and job-ready graduates. Within this context, two educational models have been developed: vocational education offered by Vocational High Schools (SMK) and the Double Track programs implemented in Senior High Schools (SMA). Vocational education is explicitly designed to equip students with technical skills aligned with industry demands (Setiawan & Pratama, 2024). These institutions are oriented toward producing a skilled workforce with diverse competencies, capable of adapting to advances in science and technology (Amron et al., 2018). Conversely, the The High School Double Track Program aims to supplement regular academic instruction with practical skills and specialized expertise (Kementerian Pendidikan dan Kebudayaan, 2023), thereby better preparing students to enter the workforce or entrepreneurship upon graduation (Hozairi et al., 2024). This program serves as an alternative for high school students who do not pursue tertiary education, enabling them to acquire more applicable vocational skills (Septian, 2024).

The differing approaches of these two programs have direct implications for graduates' work readiness. Research by Rahardjo et al. (2024) indicates that graduates from Vocational Education tend to possess stronger and more specialized technical skills, particularly in fields closely aligned with industry needs. Meanwhile, graduates of the Double Track Program demonstrate greater flexibility across various occupational sectors due to a blend of robust academic and vocational skills, as reflected in the entrepreneurial success of some students (Ridhwanah, 2021). Furthermore, studies comparing the quality of graduates from three-year and four-year Vocational High School (SMK) programs indicate that graduates from the four-year program demonstrate higher quality in aspects such as teamwork, discipline, and leadership (Soenarto et al., 2018). These findings bear significant implications within the context of Indonesia's increasingly dynamic and diverse workforce demands. Accordingly, synergy between educational institutions and industry is pivotal in enhancing the work readiness of graduates from both programs, thereby enabling them to compete effectively in an evolving job market.

Empirical observations reveal that Vocational Education excels in preparing graduates for employment through its skills-based approach, strong industry partnerships, and structured apprenticeship systems. In contrast, The High School Double Track Program offers greater flexibility for students intending to pursue higher education but faces challenges in providing adequate hands-on work experience. The primary obstacles for the Double Track Program include limited practical facilities and minimal industry involvement, whereas Vocational Education grapples with ensuring curriculum relevance in the face of rapid industrial advancements (Alfiyah et al., 2022; Yoto et al., 2024; Zukna & Sassi, 2024). Therefore, strengthening collaboration between schools and industry is essential in both programs to optimize graduates' work readiness.

Several studies have demonstrated that vocational education benefits from industry-based skills development through a widely implemented Competency-Based Training (CBT) approach in Vocational High Schools (Prasetio, 2021; Vachruddin et al., 2023; Wahyuni & Hartono, 2025). Conversely, the Double Track program provides a valuable solution for senior high schools traditionally oriented towards academic education by integrating supplementary skills training aimed at enhancing graduates' competitiveness in the job market (Mustaghfiroh, 2022; Kurniawan et al., 2024). Nevertheless, the relative effectiveness of these two educational models in adequately preparing students for

employment remains a subject of academic debate, given the variability in curriculum implementation and levels of industry engagement.

METHODS

This study employs a qualitative approach utilizing a comparative case study method to examine the effectiveness of The High School Double Track Program and Vocational Education Programs in enhancing graduates' work readiness. The research focuses on analyzing policy implementation, instructional strategies, and industry collaboration in supporting graduate preparedness, with a particular emphasis on the tourism sector, specifically culinary and hospitality concentrations.

The study was conducted at SMA Immanuel Batu, located at Wukir Street No. 3, Batu City, East Java, in April 2025. The population comprises students and graduates of The High School Double Track Program, educators, school principals, and industry representatives involved in partnership initiatives. Purposive sampling was employed to select research participants based on specific criteria (Kumara, 2018), which include: (1) graduates with work or internship experience in industry; (2) teachers and principals knowledgeable about curriculum implementation; and (3) industry representatives engaged in partnership programs.

Data collection instruments consisted of semi-structured interviews, participatory observations, and document analysis. Interviews aimed to capture participants' experiences and perspectives, while participatory observations provided direct insight into the learning processes and school-industry interactions. Document analysis involved reviewing curriculum policies, program evaluations, and partnership reports. Method triangulation was applied to ensure data validity and reliability by cross-verifying information obtained from interviews, observations, and documents (Susanto et al., 2023).

The data collection process comprised several stages: identifying subjects according to purposive sampling criteria; conducting in-depth interviews with students, teachers, principals, and industry representatives; observing the learning process and industry engagement; followed by document analysis of relevant curricular and evaluative materials. Finally, data triangulation enhanced the credibility of the findings.

Data analysis followed the Miles and Huberman model (as cited in Zulfirman, 2022), encompassing three phases: (1) data reduction, involving categorization and elimination of irrelevant data; (2) data display, by organizing related data with similar meanings; and (3) conclusion drawing, interpreting findings in relation to the research focus. The final analysis addressed the research questions outlined in the study's background. This methodological approach aims to provide a comprehensive understanding of the strengths and challenges of each educational model in preparing graduates for the competitive workforce.

RESULTS AND DISCUSSION

Following the collection and analysis of data from interviews, observations, and documentation, this study reveals key findings on the implementation of the Double Track Program, its comparison between SMA and SMK, and the impact on graduates' work readiness at SMA Immanuel Batu.

Double Track Program Description

The Double Track Program at the senior high school level is designed to equip students with supplementary skills without disrupting the primary academic curriculum, aiming to enhance work readiness and reduce unemployment. Through this program, students receive practical training in areas such as culinary arts, graphic design, sewing, and digital marketing. Interviews with the Head of Curriculum at SMA Immanuel Batu indicate that the Double Track Program is categorized as a training and self-development initiative, particularly focusing on culinary and hospitality concentrations. Consistent with Sulistyowati's (2025) findings, the program addresses the challenges posed by the large number of high school graduates who enter the workforce directly without pursuing higher education.

The implementation of the Double Track Program seeks to optimally serve both students intending to continue their education and those entering the workforce immediately (Santosa et al., 2019). Documentation and interviews with teachers reveal that approximately 40% of SMA Immanuel Batu graduates who participated in self-development training have started small businesses, worked as casual hotel staff, or secured employment aligned with their competencies. Observations and interviews further show that students exhibit greater enthusiasm during practical sessions compared to theoretical lessons, expressing satisfaction and skill development through self-development training. These findings suggest that the program has a tangible positive impact on graduates' readiness for work.

In contrast to Vocational High Schools (SMK), where vocational training constitutes the core curriculum, the Double Track Program at SMA functions as a complementary activity to academic subjects. Consequently, training duration and practice intensity are shorter and facilities lack industry-standard quality compared to SMK (Akhsova, 2021; Mustaghfiroh, 2022). Interviews with industry trainers reveal that the Double Track Program is an innovative approach; unlike SMK students who enter with basic skills, high school students require foundational training to develop skills that meet industry standards. Since Double Track programs are often organized as extracurricular or additional activities, skill mastery tends to be less comprehensive (Akhsova, 2021).

The SMK curriculum emphasizes practical experience more than theory, enabling students to gain hands-on expertise in their chosen fields, thereby ensuring their readiness for employment with competencies aligned to industry demands. However, challenges persist, including the need to update curricula to better reflect industry requirements and to improve student preparedness for the workforce. Aryawan (2023) highlights these issues, noting the necessity for curriculum enhancement, improved teaching quality, and more effective English instruction in vocational education.

Furthermore, research by Aris Ichwanto et al. (2020) underscores the vital role of vocational education in Indonesia's economic development, advocating for holistic human resource development encompassing mastery of science, technology, arts, and sports. Accordingly, SMK vocational education must continue to innovate by adjusting curricula, enhancing teacher competence, and strengthening students' soft skills to adapt to industry dynamics and contribute to national economic growth.

Graduates' Work Readiness

This study identifies several indicators within the Double Track Program and Vocational Education that influence the success of graduates' work readiness. These indicators are summarized in Table 1 below:

Table 1. Work Readiness Indicators

Aspects	Double Track Program (SMA)	Vocational Education (SMK)
Skills	Possess additional skills, particularly in entrepreneurship and the creative economy, but lack direct industry experience.	Excel in technical industry skills due to a curriculum focused on work readiness.
Knowledge	Primarily academic theoretical knowledge supplemented with skills training, without major curriculum changes.	Integrate theoretical knowledge with industrial practice for a more contextualized understanding.
Personality	Foster independent and creative work ethics through entrepreneurship training, yet experience less intensive industrial practice.	Develop a more professional attitude shaped by direct industrial practice aligned with business standards.

The table demonstrates that although SMK graduates are technically better prepared to enter the industrial workforce, the Double Track Program significantly contributes by equipping SMA students with additional relevant skills, particularly in entrepreneurship and the creative economy.

Work Readiness: Strengths and Weaknesses of the Programs

Graduates of Vocational High Schools (SMK) generally demonstrate stronger work readiness compared to those from the High School Double Track Program, particularly in technical skills, industrial work competencies, and work attitudes. This advantage stems from the SMK learning approach, which emphasizes field-based practice, the availability of adequate training facilities, collaboration with industry, and competency-based assessments. The study by Mahfud et al., (2020) revealed that vocational high school students' career readiness is significantly influenced by the quality of learning and psychological capital, while social capital indirectly contributes by strengthening psychological capital. Furthermore, the quality of learning also enhances both social and psychological capital, making the development of all three aspects essential to optimally support students' career readiness. These findings underscore that improving students' career readiness requires not only enhancing academic quality but also strengthening their social and psychological capital to better prepare them for the challenges of the workforce.

The Industrial Work Practice (Prakerin) program at SMK provides students with direct exposure to the workforce, significantly enhancing their readiness to enter the job market (Wahyuni et al., 2021). Yusadinata et al. (2021) reported that Prakerin experience, information about the workforce, and work motivation collectively have a positive and significant impact on vocational students' work readiness, contributing 56.10% to this readiness. Moreover, industrial work practice, the intensity of guidance from the industry, and vocational competencies contribute significantly—accounting for over 50%—to improving the work readiness of students at SMK Perbankan Pekanbaru, with industrial work practice and guidance serving as the primary factors (Putri & Sutarto, 2018). Furthermore, cooperation between SMKs and industries grants students access to facilities meeting industry standards, allowing them to develop relevant skills. Competency-based assessments ensure that students not only grasp theoretical knowledge but are also capable of applying it in practical work situations.

Nonetheless, challenges remain, including disparities in facility quality and industry partnerships across schools, as well as insufficient integration of soft skills within the curriculum. Rakim et al. (2017), provides a solution by applying the SHESIL learning model-which integrates soft skills, hard skills, and environmental awareness-that can effectively improve the competence of vocational students, in line with national education goals that emphasize character building and comprehensive skill development.

High school graduates who take part in the Double Track Program have advantages in adaptation flexibility, academic mastery, and basic entrepreneurial skills. The program is designed to provide additional skills to high school students without changing the structure of the main academic curriculum. Study Cholidah et al. (2024), the Double Track Program had a positive impact on improving students' practical and academic skills, while strengthening the school's reputation. Through this program, students receive training in practical skills such as catering, graphic design, sewing, and digital marketing. This approach is designed to address the challenge of the high number of high school graduates who do not continue to college and enter the workforce directly (Dinaloni & Indrawati, 2021). By providing additional skills training, the program is expected to improve students' work readiness and reduce the unemployment rate among high school graduates.

Santosa et al. (2019) found that the Double Track Program effectively serves students who plan to continue education as well as those entering the workforce directly. The program enhances both vocational competencies and soft skills critical for employment success. However, challenges include limited training duration and the absence of work internships. Additionally, funding constraints and inadequate equipment hinder the program's implementation (Cholidah et al., 2024). In summary, SMK excels in technical readiness and industry experience, while the Double Track Program offers a flexible alternative by providing supplementary skills that

bridge the gap between the workforce and higher education.

Supporting and Hindering Factors of the Program

The Double Track Program and Vocational Education are influenced by both supporting and hindering factors that affect their overall success. These factors are summarized in Table 2 below:

Table 2. Supporting and Hindering Factors of the Program

Aspects	Double Track Program (SMA)	Vocational Education (SMK)
Curriculum	Provides additional certified skills beyond the academic curriculum.	Fully integrated into the main curriculum and aligned with industry standards.
Training Duration	Short-term (several months with weekly sessions).	Long-term (3 years) with intensive practical training.
Industry Experience	Limited, typically training without formal internships.	Generally, includes mandatory Field Work Practice (PKL/Prakerin).
Industry Perception	Graduates are often perceived as beginners in the workforce.	graduates are recognized for competence in entry-level positions.
Student Motivation	Primarily academic-oriented, with skills as a secondary focus.	Primarily focused on preparing for employment after graduation.

Note: Entry-level job refers to a position suitable for individuals with limited work experience in a specific field.

Implications for Secondary Education Policy

The Double Track Program at the senior high school level aims to equip students with additional skills relevant to the job market. However, training conducted solely within the school environment is often inadequate to provide the practical experience demanded by industry. Therefore, it is essential to enhance this program through the implementation of real internships and direct collaboration with business and industry (DUDI). Such partnerships offer students hands-on field experience, expand their professional networks, and deepen their understanding of industry needs and dynamics. Mustaghfiroh (2022) demonstrated that cooperation among schools, local governments, and DUDI in the Double Track Program at SMA Negeri 1 Jetis Ponorogo effectively improved student skills and ensured training relevance to industry requirements.

The rapid technological advancements characteristic of the Industry 4.0 and Society 5.0 eras necessitate continuous updates to vocational education curricula to maintain alignment with industry demands. Integrating technologies such as the Internet of Things (IoT), artificial intelligence, and automation into vocational curricula is critical for preparing graduates who are both competent and adaptive to change (Zukna & Sassi, 2024). Curricula must also be designed to develop 21st-century skills, including problem-solving, creativity, and digital literacy, to address the challenges posed by the Industrial Revolution 4.0 (Qur'ani et al., 2024). The success of vocational high school graduates in navigating the modern workforce hinges on the effective synergy between teachers' roles, technology, and social capital (Utami et al., 2024). Industry 5.0 necessitates the ethical and sustainable integration of humans and technology, with teachers serving as pivotal facilitators in this process. Collaborative efforts among all stakeholders are critical to bridging existing gaps and ensuring a seamless transition from school to work.

Graduates of The High School Double Track Program benefit from enhanced adaptability and foundational entrepreneurial skills. However, to elevate recognition of their competencies within the workforce, cross-track learning complemented by advanced certification training is necessary. Certification provides tangible proof of skills, thereby increasing graduates' competitiveness in the job market. Putri Emalia (2024) found that Double Track programs augmented with skills certification effectively prepare high school graduates for employment or entrepreneurship based on their

capabilities. Consequently, governmental policies should support regulations that strengthen school-industry partnerships and fund structured internship programs as integral components of the Double Track curriculum. Secondary education policies must prioritize the integration of authentic vocational training, industry-recognized certification, and technology-driven adaptive curriculum.

CONCLUSION

Based on the comparative study of The High School Double Track Program and Vocational Education regarding graduates' work readiness, it was found that vocational education is more effective in fostering work readiness through a practice-based curriculum, technical skills development, and more intensive industrial experience. Conversely, The High School Double Track Program offers greater adaptability and supplementary skills for students who do not pursue higher education; however, it remains insufficient for full industrial work readiness without further training. These findings highlight the necessity for more adaptive education policies that promote the integration of industrial experience within the high school curriculum and strengthen character education and soft skills development in Vocational High Schools (SMK). The scientific contribution of this research lies in its comparative analysis, which offers valuable insights for the formulation of secondary education policies, especially in designing learning models that are more responsive to job market dynamics. By identifying the strengths and challenges of each program, this study provides a foundation for developing more effective educational strategies aimed at producing graduates who are competent, adaptable, and prepared to compete in the modern workforce.

SUGGESTION

Longitudinal research is recommended to assess the career success of Double Track Senior High School (SMA) and Vocational High School (SMK) graduates within 2 to 5 years post-graduation, encompassing both formal employment and self-employment. Further studies should focus on comparing work readiness based on specific skill areas (e.g., graphic design or automotive) to identify the most promising sectors for development within each educational pathway. Additionally, research on the effectiveness of project-based learning models and the implementation of industrial internships in enhancing the work readiness of Double Track students is warranted. Lastly, it is essential to investigate the perceptions of business and industry stakeholders regarding graduates from both The High School Double Track Program and Vocational Schools to determine the competencies most relevant to current job market demands.

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