

Integration of History in the Industrial Curriculum of Aviation Vocational High Schools: A Teaching Factory Case Study

Veri Setiawan¹, Ratih Lutfita Ningtyas², Wulan Nurjanah³

¹Universitas Sultan Ageng Tirtayasa Banten, Indonesia

²Universitas Sultan Ageng Tirtayasa Banten, Indonesia

³Universitas Sultan Ageng Tirtayasa Banten, Indonesia



veri.setiawan@untirta.ac.id

Abstract

The Industry 4.0 revolution has driven transformation in Indonesian vocational education, yet normative-adaptive subjects such as history are often positioned as supplementary curriculum components. This study aims to analyze the forms of history learning integration within the industry-based Teaching Factory (TEFA) curriculum at SMK Penerbangan AAG Adisutjipto Yogyakarta, the pedagogical strategies employed by teachers, and the systemic and pedagogical challenges encountered. A qualitative approach with a single case study design was employed. Data were collected through semi-structured interviews, limited participatory observations, and document analysis, then analyzed using the interactive model of Miles, Huberman, and Saldaña strengthened with systematic coding-based thematic analysis techniques. Source and technique triangulation were applied to ensure the credibility of findings. The results indicate that history teachers attempted contextualization through the integration of aviation technology history, industry history, and professional value cultivation. However, the implementation remains partial and dependent on individual teacher initiatives due to the absence of operational curriculum guidelines and structured instructional resources. These findings imply that history learning in vocational schools has the potential to contribute to the formation of professional identity and contextual industrial literacy when systematically integrated into vocational curricula. Therefore, this study recommends the development of an institutionally embedded vocational history learning model to support interdisciplinary integration within the Teaching Factory framework.

Keywords: History Learning, Industry-based Curriculum, Vocational Education, Teaching Factory, Case Study

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INTRODUCTION

The development of the Industrial Revolution 4.0 and the acceleration of technological disruption have brought fundamental changes to the structure of the world of work and demanded adjustments to the paradigm of educational implementation, particularly vocational education. Fransiska (2024) Vocational High Schools (SMK) hold a strategic position in preparing human resources who are competent and adaptive to the needs of a dynamic labor market. The development of the SMK curriculum is required to always be responsive, flexible, and relevant to the needs of the business world and the

industrial world (DUDI). The Indonesian government has responded to these challenges through strengthening link and match policies and developing work-based curricula, one of which is implemented through the Merdeka Curriculum by granting broader autonomy to educational institutions in designing contextual learning (Billett, 2011; Darise, 2019). These curriculum changes are inevitable in Indonesia's dynamic education system. The curriculum is not only an administrative tool for the learning process, but also plays a crucial role in shaping the direction of human resource development (Anif Fadillah et al., 2026).

A number of studies show that the implementation of an industry-based curriculum in vocational high schools (SMK) contributes positively to improving the relevance of graduates' competencies to labor market needs, especially when learning is designed around authentic projects, real problem-solving, and supported by collaboration with industry partners (Agustian et al., 2024; Suharno et al., 2020). However, the development of such a curriculum still tends to be oriented toward productive subjects and the strengthening of technical vocational competencies. Normative-adaptive subjects, such as history, are often positioned as complementary elements of the curriculum and receive less attention in the context of strengthening students' vocational competencies (Christopher Winch, 2010; Michael Fullan, 2016; Rinaldo Adi Pratama, Maskun, 2019). This condition indicates an imbalance between strengthening technical skills and developing dimensions of values, character, and historical awareness, which have an important contribution in shaping the work ethic and professional identity of vocational high school graduates.

In fact, history learning in vocational high schools (SMK) actually has strategic opportunities to be developed as a vehicle for shaping work character, professional awareness, and students' reflective abilities through the integration of themes such as the history of technology, the history of professions, and the dynamics of the industrial world (Carretero et al., 2012; Setiawan, 2025). With the flexibility of the Merdeka Curriculum and adequate time allocation, history learning has the potential to be designed in a more contextual manner and be more relevant to the needs of vocational education. Conceptually, history learning has strategic potential in the context of vocational education because it not only functions as a transfer of knowledge about the past, but also plays a role in building historical awareness, shaping professional identity, and helping students understand the social, economic, and cultural dynamics surrounding the world of work (Carretero et al., 2012). This approach is aligned with the concept of learning in the context of work proposed by Billett (2011), which emphasizes that meaningful learning occurs when the learning context reflects the real practices of the professional community that students will enter.

However, the reality of implementation shows that history learning in vocational high schools (SMK) still faces various obstacles. Limited teachers' conceptual understanding of the industry-based curriculum paradigm, the lack of specific pedagogical guidance, and weak integration between the objectives of history learning and the labor market needs of students are the main challenges (Balqis Najmi Aqila Putri Syaella, Firda Nur Fauziah, Syahla Aulia Syahida, 2025; Christopher Winch, 2010). Several studies also show that history learning practices in vocational high schools are still dominated by conventional approaches and have not systematically linked history materials with the vocational context of students (Andi Mustari, Nurmala Sari, Nurulwati, 2024; Nuraida, 2025; Purwiyastuti, 2017). This indicates that innovation in history learning in vocational high schools has not developed optimally and has not yet been built within a structured industry-based curriculum framework.

Based on the description, there appears to be a fairly significant research gap between studies on industry-based curricula in vocational high schools (SMK), which mostly focus on vocational competencies and productive learning management, and

studies on history learning, which are more often conducted in the context of general education (Agustian et al., 2024; Carretero, Mario, Mikel Asensio, 2012). Research that specifically examines the design, implementation, and evaluation of history learning within the framework of an industry-based curriculum in SMK is still very limited. Therefore, research on the implementation of history learning based on an industry curriculum is important and relevant, not only to enrich the study of history pedagogy, but also to expand the contribution of history education in shaping SMK graduates who possess technical competencies, historical awareness, as well as social and cultural readiness to face the world of work (Nalendro et al., 2025; Seixas, 2015).

In line with these needs, various studies recommend the need to strengthen the integration of history learning in the vocational high school curriculum through increasing teacher capacity in applying contextual learning approaches, developing history teaching materials that are relevant to the dynamics of the industrial world, and strengthening collaboration between schools and industry partners in designing project-based learning and real-world problems (Nalendro et al., 2025; Suharno, Nugroho Agung Pambudi, 2020). Based on the problem background and the identified research gap, this study aims to analyze the implementation of history learning based on an industrial curriculum at SMK Penerbangan AAG Adisutjipto, specifically directed at: (1) identifying forms of integration of history learning in an industrial curriculum based on Teaching Factory (TEFA); (2) analyzing the pedagogical strategies applied by history teachers in contextualizing teaching materials; and (3) examining the systemic and pedagogical constraints faced in implementing history learning based on an industrial curriculum in vocational high schools.

METHOD

Research Approach and Design

This study uses a qualitative approach with a single case study design to obtain an in-depth and contextual understanding of the implementation of history learning based on an industry curriculum. The qualitative approach was chosen because it allows exploration of the processes, meanings, and dynamics of learning practices that occur naturally within the school environment (Creswell, 2007; Yin, 2018). The single case study design is focused on one specific context, namely SMK Penerbangan AAG Adisutjipto located in Yogyakarta. This site was selected purposively because of its characteristics as an aviation vocational school that applies a work-oriented curriculum through the Teaching Factory (TEFA) concept and maintains close partnerships with the business sector and industry (DUDI). SMK Penerbangan AAG Adisutjipto is one of the few vocational schools in Indonesia managed by the Indonesian Air Force Foundation with a strong industry-based curriculum, thus providing a rich and representative research context for examining the phenomenon of integrating history learning within the framework of a vocational curriculum (Wahjusaputri & Bunyamin, 2022).

Research Subject

Research subjects were determined through purposive sampling techniques by considering the relevance of the informants' roles to the research focus (Patton, 2015). The main informants included history subject teachers responsible for planning and implementing learning in grades X and XI, the vice principal for curriculum who coordinates curriculum implementation at the educational unit level, the Teaching Factory (TEFA) coordinator who has direct knowledge of partnership mechanisms with industry and the business world (DUDI), as well as grade X and XI students who are the target of the learning process. The selection of informants was carried out gradually and developed according to the research data needs (snowball sampling) until data saturation was

reached, namely when new information obtained from additional informants no longer produced substantially different findings (Patton, 2015).

Data Collection Techniques

Data collection was carried out through a combination of three main techniques, namely semi-structured interviews, limited participant observation, and document analysis. Semi-structured interviews were used as the primary technique to explore informants' understanding, experiences, and perceptions related to the planning and implementation of history learning based on an industry curriculum. The interview guide was developed based on the research conceptual framework referring to industry-based curriculum theory and contextual history pedagogy, with open-ended questions that allowed informants to elaborate on their experiences in detail. Limited participant observation was conducted on history learning practices in the classroom to capture the dynamics of teacher-student interaction, the pedagogical strategies applied, and the learning context directly. Observations were conducted over several meetings to obtain a comprehensive picture and reduce momentary observation bias (Tracy, 2013). Document analysis included reviewing teaching modules, learning objective flow (ATP), learning tools, annual programs, and students' assignment products in order to examine consistency between learning planning and implementation (Riwayat, 2025).

Data Analysis Techniques

The collected data were analyzed interactively by referring to the interactive analysis model of Matthew B. Miles and A. Michael Huberman (2014), which includes three main stages: (1) data condensation, encompassing the processes of selecting, focusing, simplifying, abstracting, and transforming raw data into meaningful units of analysis; (2) data display, namely organizing data into thematic patterns that enable conclusions to be drawn; and (3) conclusion drawing and verification, namely the process of interpreting findings and strengthening conclusions through triangulation. The analysis process was conducted simultaneously from the data collection stage through to the interpretation of final findings, thus allowing continuous reflection on the data obtained and iterative development of the research focus.

To strengthen analytical rigor, the data analysis process was complemented by a systematic thematic coding technique inspired by the NVivo thematic analysis approach. The coding stages included: (a) open coding, namely the initial labeling process of data units from interview transcripts, observation notes, and curriculum documents to identify key concepts; (b) axial coding, namely the process of grouping initial codes into larger thematic categories based on conceptual relationships among codes; and (c) selective coding, namely the process of identifying central themes that connect all thematic categories into a coherent analytical narrative (Sintha Wahjusaputri, 2022). Through this approach, each interview quotation and observation datum was mapped into a thematic matrix that enabled researchers to verify the consistency of findings across data sources. The coding process produced several main themes, namely: (1) forms of curricular integration, (2) pedagogical contextualization strategies, (3) constraints related to teaching materials and operational guidelines, and (4) challenges in teacher capacity.

Data Validity

To ensure the credibility of the research findings, source triangulation was conducted (comparing data from teachers, students, the TEFA coordinator, and curriculum managers) as well as technique triangulation (comparing data from interviews, observations, and documents). In addition, member checking was carried out with key informants to ensure alignment between the researcher's interpretation and the reality intended by the participants (Creswell, 2007). The research process was carried

out during the period from August to November 2024, covering the preparation stage, field data collection, and data analysis.

RESULT

Form of Integration of History Learning within the Teaching Factory (TEFA) Framework

The research results show that the implementation of history learning at AAG Adisutjipto Aviation Vocational High School has been directed toward efforts to integrate it with an industry curriculum based on the Teaching Factory (TEFA). Teaching Factory (TEFA) is a learning concept in vocational high schools that refers to industry process and product standards, where the production environment at school is integrated with the learning process so that it produces products or services that meet industry standards (Wahjusaputri & Bunyamin, 2022; Paryono, 2015). Findings from interviews with the history teacher (Mrs. Rahni) show a fairly good understanding of the concept of integrating history into TEFA, as reflected in the following statement:

"History integration in TEFA is carried out by aligning part of the history material with the area of expertise studied by students. Some Indonesian History material is still taught, but its portion is reduced to make room for history material related to the industrial world or the world of work. For example, for majors related to aviation, students also study the history of aviation in Indonesia, the history of aircraft development, as well as the history of companies connected to that field."

From the thematic coding process, it was found that the forms of integration implemented can be categorized into three main patterns. First, the condensation of Indonesian History material while still maintaining the broad outline of the course of historical development from the Hindu-Buddhist era to the period of defending independence, on the grounds that most of this material has been introduced since the primary education level. Second, the development of vocational history material contextualized to the students' skill programs, covering the history of aviation, the history of aircraft development from propeller engines to modern jets, and the history of industry partner companies. Third, the introduction of innovator figures and professionals in the field of aviation technology as part of efforts to foster a work ethic and a spirit of innovation.

Findings from interviews with the TEFA coordinator (Mrs. Ika) reinforce the picture of the school's policy in supporting cross-subject integration, as stated:

"Schools are actually continuously striving to encourage a link and match between learning materials in schools and the needs of industry. This effort is carried out not only in productive subjects, but also in the cluster of normative adaptive subjects. Every year, schools try to organize training or teacher competency improvement activities by inviting partner companies of the school that represent the business and industrial world (DUDI)."

However, the TEFA coordinator also acknowledged that the integration process is not yet fully standardized and still requires further standardization:

"For now, the process is still ongoing. The school is still continuously striving to standardize the curriculum so that it is more aligned with industry needs, including in normative adaptive subjects. This means that the integration has not yet been fully standardized or uniform because the process of developing and refining the curriculum is still taking place gradually."

Pedagogical Contextualization Strategy of History Teachers

The analysis results of learning practices show that history teachers develop four forms of contextualization strategies categorized through the axial coding process. First, the use of historical examples of the development of aviation technology as an

introduction to understanding the dynamics of technological innovation over time. The history teacher explains the relevance of history material to the students' field of expertise:

"The most relevant material is material that is directly related to the students' field of expertise. For example, in majors that study aviation, students learn the history of aircraft and the history of aviation. Then when they are in Grade XI, they begin to study the history of the companies they will later visit when carrying out their internship in Grade XII."

Second, an introduction to the history of the aviation and transportation industry that connects the development of the national aviation industry with the global context, including the role of major aviation companies in driving technological progress. Third, a discussion of innovative figures and professionals in the field of aviation technology aimed at inspiring students to develop a work ethic and a spirit of innovation. Fourth, linking national history material with the values of discipline, nationalism, and professionalism that are relevant to the world of aviation. Regarding the learning strategies implemented, the history teacher revealed the use of varied approaches to increase student engagement:

"I usually use several learning strategies such as educational games, discussions, and project-based learning. Through discussions, students can work together to find information about a historical topic related to their industrial field. The use of games can increase students' motivation and enthusiasm for learning."

Students' responses to the contextualization efforts made by the teacher were recorded as quite positive, as stated by the history teacher:

"The students' response was quite positive. They seemed more interested and more enthusiastic when studying new material that was directly related to their field of expertise. Their curiosity also increased, making the classroom atmosphere more active compared to when they only studied Indonesian History material in general."

Systemic and Pedagogical Constraints in Implementation

The selective coding process identified that implementation constraints are multidimensional in nature and can be categorized into three main dimensions. The first dimension relates to the limitations of contextual teaching materials. Data from the interviews showed that teachers do not yet have access to modules or history books specifically designed for the vocational high school context, so they have to compile materials independently. The history teacher explained:

"At first I felt quite confused because I did not yet have a clear picture of how to connect history material with TEFA activities. The textbooks and worksheets still refer to the government curriculum, so they do not yet fully support integration with the TEFA concept. Limited reference sources also became a challenge in preparing materials that are relevant to the industrial world."

The TEFA Coordinator also confirmed similar findings regarding material gaps in normative-adaptive subjects:

"One of the obstacles that is still evident is the existence of a material gap in normative-adaptive subjects, including History. This occurs because the preparation of essential material is still left to each individual teacher. As a result, not all material is directly connected to the industrial context or the TEFA activities taking place at the school."

The second dimension relates to limitations in pedagogical guidance and cross-subject coordination. The TEFA coordinator explained that coordination between normative teachers and productive teachers is still not yet optimal:

"Coordination is actually always pursued through internal school forums, such as curriculum meetings or discussions among teachers. However, in practice, the integration of material in normative-adaptive subjects still heavily depends on each

individual teacher. The essential material taught is often prepared independently by teachers, so its implementation can vary between classes or between teachers."

The third dimension relates to the challenges of paradigm adaptation and teacher capacity. The TEFA coordinator emphasized that not all teachers have sufficient capacity to carry out integration independently:

"It is hoped that teachers will have the initiative and creativity to formulate their own learning materials that are more relevant to the industrial curriculum and TEFA activities at school. However, in reality, not all teachers are able to do this. Some still revert to using normative materials that are general in nature and not yet fully integrated with the industrial context."

In addition, the history teacher also identified operational constraints that limit the effectiveness of learning strategies:

"Several constraints were encountered, including limited instructional time, particularly when employing game-based or project-based learning methods that require extended periods. The use of devices such as mobile phones and Wi-Fi connectivity also posed occasional challenges, as network signals were not consistently available in all classrooms. In addition, students' interest sometimes tended to focus narrowly on their respective internship placements (PKL), which resulted in less balanced participation during classroom discussions."

Based on the overall findings regarding implementation constraints, the thematic coding process produced a thematic matrix that organizes the findings into four main categories: (1) limited availability of contextual teaching materials; (2) the absence of policy direction and operational curriculum guidelines; (3) weak cross-subject coordination; and (4) challenges in adapting teachers' pedagogical paradigms. These four categories are interrelated and collectively constitute a complex system of barriers to the implementation of history learning within an industry-based curriculum framework.

DISCUSSION

Integration of History within an Industry-Based Curriculum Framework: A Conceptual Perspective

The findings of this study confirm that history education within the context of vocational schooling does not need to be eliminated, but rather reoriented to become more relevant to labor market demands. The contextualization efforts undertaken by history teachers at SMK Penerbangan AAG Adisutjipto reflect elements of the contextual teaching and learning approach as proposed by Billett (2011), which emphasizes the importance of vocational learning that connects subject matter with the real-world work situations students are preparing to enter.

In the context of history instruction at an aviation vocational school, teachers link national history content with the historical development of Indonesia's aviation industry, the evolution of aviation technology over time, and the contributions of key figures in national aviation history. This approach demonstrates an effort to bridge national curriculum demands with the contextual needs of vocational education.

Consistent with Carretero et al. (2012), contextualized history learning can strengthen learning meaning, as students are able to connect historical knowledge with the social and professional realities they encounter. In this sense, history is no longer positioned merely as a normative subject, but as an instrument in shaping the professional identity of vocational students. This finding also aligns with the concept of situated learning proposed by Billett (2011), which emphasizes that meaningful learning occurs when learning contexts reflect the authentic practices of the communities students are preparing to join. Within the TEFA framework, the context of history learning is directed toward reflecting the aviation industry environment that will become the students' professional field.

The contextualization approach developed by teachers indicates a serious effort to establish the relevance of history learning to students' future professional needs. Carretero et al. (2012) argue that history learning which connects content to students' professional contexts can significantly enhance learning motivation and historical understanding. This is further supported by Seixas (2016), who emphasizes that students tend to be more engaged in history learning when they perceive connections between historical knowledge and their own experiences and aspirations. The empirical findings of this study, particularly the positive responses of students to materials linked to their field of expertise, reinforce these theoretical arguments.

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The Gap Between Institutional Policy and Pedagogical Practice

Despite an awareness of the pedagogical need to align history learning with workplace contexts, this study reveals a significant gap between institutional policy and classroom-level pedagogical practice. This gap manifests in several dimensions. First, there is an absence of an operational curriculum guide that explicitly defines the strategic role of general subjects in supporting vocational graduate profiles. As a result, integration tends to remain implicit rather than explicitly articulated within the school's academic policy framework. This finding is consistent with Christopher Winch (2010), who argues that one of the fundamental weaknesses of vocational education systems lies in the overly rigid separation between general education and vocational training, which in turn constrains the development of holistic student competencies.

Second, coordination between normative subject teachers and productive subject teachers remains informal and lacks systematic structure. This condition indicates a policy gap between the vision of an industry-based curriculum, which emphasizes holistic graduate competencies, and the reality of implementation, where normative-adaptive subjects are still treated as separate entities from vocational programs. This aligns with findings by Syaeta et al. (2025), which highlight that limited learning resources and weak cross-subject coordination constitute major barriers in curriculum implementation at vocational schools.

Third, the reliance on individual teacher initiative leads to variations in instructional quality that are not standardized. Michael Fullan (2016) identifies key dimensions of successful curriculum implementation, including the availability of learning resources, teacher support systems, and the compatibility between policy design and classroom-level needs. These dimensions are not yet adequately fulfilled in the implementation of industry-based history learning at SMK Penerbangan AAG Adisutjipto, as evidenced by limited contextual teaching materials, minimal teacher professional development programs, and the absence of clear operational guidelines. Addressing this issue requires a central role for the Principal, Deputy Curriculum Officer, and TEFA Coordinator in formulating strategic and practical programs to ensure educational planning aligns with the needs of students and the industry Rahayu et al., (2025). Innovation in educational management has great significance in managing change, improving the quality of learning, administrative efficiency, and stimulating student creativity (Tenti Elizah, et al., 2024).

Challenges in the Pedagogical Transformation of History Teachers in Vocational Contexts

The findings of this study reveal that history teachers, who are accustomed to an academically oriented and content-based approach as typically applied in general senior secondary schools, require sustained reflection and continuous professional development to develop the distinctive pedagogical competencies required in vocational education. As Berry et al. (2015) argue, teachers need adequate pedagogical content knowledge (PCK) to effectively transform subject matter into forms that are meaningful and accessible to learners within specific contexts. In vocational education settings, history teachers' PCK must be enriched with an understanding of vocational students' characteristics, the aviation industry context, and pedagogical strategies aligned with vocational learning needs.

The teachers' experiences in integrating history content within the Teaching Factory (TEFA) framework indicate an ongoing transition from a conventional instructional paradigm toward a contextual-vocational pedagogical paradigm. This process initially involved uncertainty and lack of preparedness, but gradually evolved through collaboration with productive subject teachers and independent learning of new content relevant to industrial contexts. This finding is consistent with Billett's (2011) framework of teacher professional development, which emphasizes that pedagogical transformation requires structured institutional support rather than reliance solely on individual teacher initiative. Without systematic professional development programs, the transformation of history teachers' pedagogical paradigms is likely to proceed slowly and unevenly, as reflected in the variation in the quality of integration practices observed across teachers in this study. This program is a concrete step to encourage educational institutions to not only focus on academic aspects, but also equip students with social, emotional, and vocational skills to be ready to face real life (Ariani, 2025).

Implications for the Development of a Vocational History Learning Model

Based on the overall findings and discussion, this study identifies the need to formulate a vocational history learning framework as a pedagogical model that can be broadly implemented in vocational high schools (SMK). The integration of Setiawan's (2025) theoretical perspective, which emphasizes that the primary challenge of history education in the era of industry-based curricula does not lie in the loss of historical relevance but in the necessity of pedagogical paradigm transformation, together with Nuraida's (2025) findings on students' low perceived relevance of history learning in vocational schools, reinforces the conclusion that history education in SMK requires the development of a pedagogical model specific to vocational education.

The proposed vocational history learning model comprises five core elements: (1) professional and workplace contextual orientation as the basis for content development; (2) the development of historical and reflective thinking skills through the analysis of technological and industrial developments; (3) the integration of industrial values such as discipline, responsibility, and professional ethos within historical contexts; (4) an interdisciplinary approach that connects history with vocational disciplines; and (5) the utilization of digital technologies and authentic project-based learning experiences grounded in industrial contexts. This model differs from conventional history instruction, which is primarily oriented toward the mastery of historical facts and chronology, as it integrates practical and professional dimensions aligned with the competencies required of vocational graduates.

The findings also contribute to ongoing discussions in vocational education theory regarding curriculum integration and the role of normative-adaptive subjects. Existing perspectives on vocational education emphasize that effective vocational learning should

integrate technical competencies with broader cognitive, historical, and value-oriented knowledge to support the formation of professional identity and contextual understanding of industrial practices. The findings of this study partially support this theoretical perspective. History teachers attempted to contextualize learning by incorporating aviation technology history, industry development, and professional values, demonstrating the potential of history education to contribute to vocational learning environments. However, the results also reveal that such integration remains largely dependent on individual teacher initiatives rather than systemic curriculum design. This indicates a gap between theoretical expectations of integrated vocational curricula and their institutional implementation in the Teaching Factory (TEFA) context.

From a policy perspective, these findings suggest that curriculum development in vocational schools should more explicitly acknowledge the strategic role of normative-adaptive subjects in shaping holistic graduate competencies. Recommendations from TEFA coordinators further highlight the need for structural support through: (a) the development of operational curriculum guidelines that explicitly integrate normative-adaptive subjects within the TEFA framework; (b) the provision of contextual teaching materials designed for vocational education settings; and (c) structured teacher professional development programs aimed at strengthening pedagogical content knowledge in vocational contexts.

CONCLUSION

This study concludes that the implementation of industry-based history learning at SMK Penerbangan AAG Adisutjipto demonstrates a clear tendency toward more contextualized instruction that aligns with the characteristics of vocational education. History teachers have attempted to integrate subject matter with themes related to the history of aviation technology, industrial development, and the cultivation of professional values and work ethic through the Teaching Factory (TEFA) approach. These contextualization efforts have contributed to increased student engagement and learning interest when historical content is connected to their field of expertise. The findings reinforce the notion that history education in vocational schools holds strategic potential in fostering professional awareness, work-related character formation, and students' reflective thinking skills.

However, the implementation remains partial and has not yet been systematically institutionalized. The integration of history learning within the industry-based curriculum is still heavily dependent on individual teacher initiative, as it is not yet supported by operational curriculum design, pedagogical guidelines, or structured contextual teaching materials at the school level. The challenges encountered are multidimensional, including limited availability of contextual learning resources, the absence of institutional policy frameworks, weak cross-subject coordination, and difficulties in adapting teachers' pedagogical paradigms. These conditions indicate a clear gap between the school's work-oriented curriculum framework and the actual classroom practices of history instruction.

Based on these findings, this study recommends: (1) strengthening school-level academic policies that explicitly integrate history within the industry-based curriculum framework; (2) developing standardized contextual history teaching modules tailored to the characteristics of vocational education that can be implemented nationally; (3) enhancing teachers' pedagogical competencies through structured and continuous professional development programs; and (4) strengthening coordination mechanisms between normative-adaptive and productive subject teachers in curriculum planning and implementation. For future research, this study suggests the development of a vocational history learning model through research and development (R&D) approaches, multi-site studies with broader scope, or quantitative experimental research to empirically test the effectiveness of vocational history learning models.

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