SYSTEMATIC REVIEW (SLR) ON THE IMPACT OF INDUSTRIAL CLASSES ON THE JOB READINESS OF VOCATIONAL HIGH SCHOOL GRADUATES

Maulana Sulton[1a*], Yoto[2b], Didik Nurhadi[3c]

[1-3]Vocational Education Study Program, Postgraduate Faculty, Universitas Negeri Malang, Indonesia

[a] *maulana.sulton.2405518@students.um.ac.id*
[b] *yoto.ft@um.ac.id*
[c] *didik.nurhadi.ft@um.ac.id*

(*) Corresponding Author
maulana.sulton.2405518@students.um.ac.id

ABSTRACT

This study aims to deeply analyze the role of the implementation of industrial class programs in Vocational High Schools in improving hard skills, soft skills, and graduates' work readiness through a Systematic Literature Review (SLR) approach. The study was conducted using the PRISMA framework and utilized the Publish or Perish database to select relevant articles. A rigorous selection process resulted in eight primary Indonesian-language articles that met the inclusion criteria for comprehensive analysis. The study results indicate that research on industrial classes remains relatively limited, with a significant increase in publications only occurring after 2022. The effectiveness of this program is influenced by several important factors, such as close partnerships between schools and industry, curriculum alignment with workplace standards, educator competency, facility availability, and ongoing training and internships. However, challenges such as limited resources, curriculum synchronization, and suboptimal industry commitment remain major obstacles to its implementation. Overall, the findings of this study confirm that industrial classes play a strategic role in developing students' technical and non-technical skills, while also serving as a bridge between education and the workplace. This program has significant potential to strengthen the competencies and increase the competitiveness of vocational high school graduates in the modern industrial era.

INTRODUCTIONS

Vocational education, particularly Vocational High Schools (SMK), plays a strategic role in preparing a skilled workforce for the Industry 4.0 era. Rapid technological developments require graduates to master not only technical skills but also work readiness, encompassing adaptability, communication skills, and a professional work ethic. In Indonesia, this challenge is increasingly apparent due to the persistent gap between the competencies taught in schools and the skills actually needed by industry. This situation underscores the importance of learning innovations that directly connect the school curriculum with industry practices to address global needs.

One widely developed innovation is the industry class, a formal collaboration model between schools and businesses/industry. In this scheme, the curriculum is developed jointly, learning materials are aligned with industry standards, and students gain practical experience that approximates real-world work conditions (Maula et al., 2023). The presence of industry classes is believed to have a positive impact: improving technical skills, fostering a work culture relevant to the industrial world, and expanding job opportunities for vocational high school graduates (Situmorang et al., 2022). Implementation through collaborations with large companies, such as BUMA School in the heavy equipment sector, serves as a concrete example of how synergy between schools and industry can produce graduates who are more competitively prepared.

Although many schools have implemented industry-focused classrooms, academic studies on their effectiveness remain incomplete. Most studies focus solely on improving technical skills, while other dimensions such as comprehensive work readiness, mastery of non-technical skills, and the long-term impact on graduates' careers remain neglected (Astuti et al., 2025; Wibowo, 2016; Yoto, 2017). Furthermore, reports from schools or industry partners are generally descriptive without in-depth analysis, while academic studies use varying methodologies, making them difficult to compare. These limitations create a knowledge gap and make it difficult for stakeholders to develop solid, evidence-based policies or strategies.

This gap can be bridged through a Systematic Literature Review (SLR), a research method that systematically filters, assesses, and synthesizes evidence. SLRs have the advantage of being conducted using transparent, standardized, and replicable procedures, making their results more credible than narrative reviews (Page et al., 2021). This approach not only helps identify strong and consistent evidence but also uncovers inconsistencies, methodological limitations, and underexplored research areas. In the context of industrial classes, SLR can map effective implementation patterns, identify contextual factors that influence outcomes, and highlight instruments used to measure students' work readiness (Affandi et al., 2025).

Through SLR, research on industrial classes can provide strategic benefits for both theory and practice. Academically, SLR contributes to strengthening the theoretical framework that explains the relationship between vocational education, industrial collaboration, and graduate work readiness. Practically, the results of this study can serve as a reference for teachers, principals, and industry partners in designing and evaluating more effective industrial class programs. Furthermore, the resulting evidence-based recommendations can also be used by policymakers in developing national strategies to strengthen vocational education. Therefore, conducting SLR related to industrial class variables is a crucial step in consolidating evidence, closing research gaps, and making a significant contribution to improving the quality of vocational education, both in Indonesia and globally.

RESEARCH METHODS

This systematic literature review uses a quantitative bibliometric approach to assess the literature to identify trends, patterns, and key research entities within a discipline. The PRISMA framework ensures a comprehensive and replicable literature review, providing a clear and transparent overview of the topic under study. The inclusion criteria were as follows: articles published by August 31, 2025, publications in Indonesian, and a focus on managing industrial classes that enhance student work readiness.

Bibliometric analysis used VOSViewer to visualize bibliographic data and analyze citation relationships, collaborations between authors, and frequently occurring keywords that reveal the intellectual structure and dynamics within the research field. The first stage of this scientific review was keyword selection, using a macro method, starting from a broad search to a more focused search. Therefore, after evaluating the limitations inherent in previous research and the scarcity of studies discussing industrial classes and student work readiness, this investigation included the keyword "Industrial Class" as the focus in the article title, abstract, and keywords section. Furthermore, the database on Google Scholar is used by researchers for various investigative purposes, including conducting literature reviews, monitoring research trends, and identifying experts in a particular field.
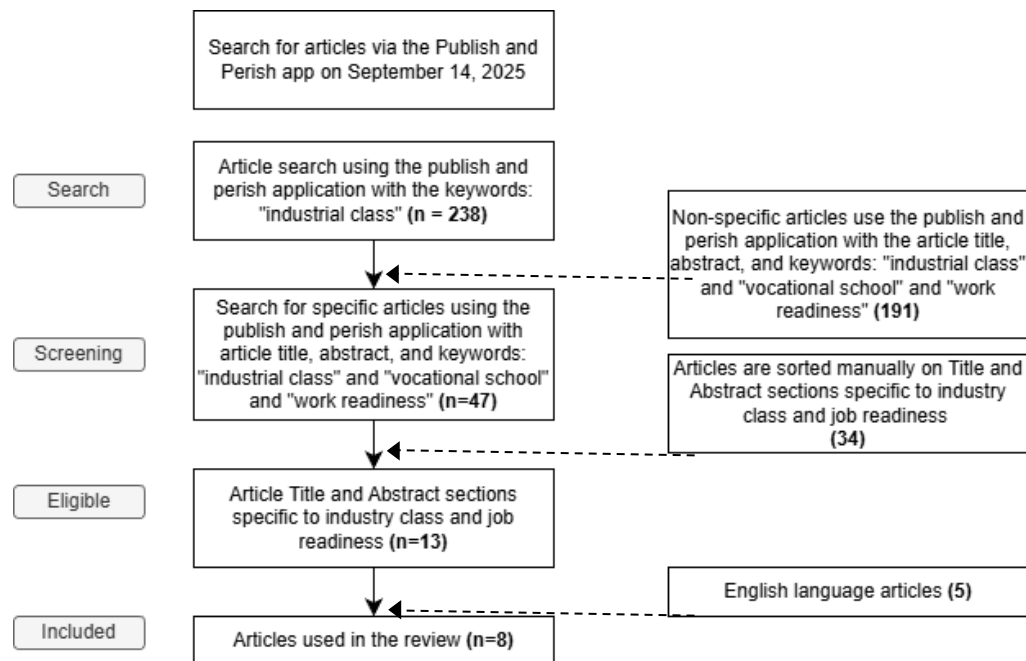
Figure 1. Prisma Diagram in Systematic Review

A search for articles through the Publish and Perish application on September 14, 2025, using the keyword "industrial class," yielded 238 articles. However, the results were more specific, specifically addressing articles discussing industrial classes in vocational high schools (SMK) and their impact on job readiness. Therefore, the keywords "industrial class" and "SMK" and "job readiness" were added, yielding 47 articles that matched the application. Of the 47 articles, 13 were manually sorted by reading the titles and abstracts, and 8 articles were found to be relevant to the topic of industrial classes and job readiness. Finally, because the author was researching Indonesian-language articles, 8 articles were obtained, as 5 were published in English. The documents were analyzed to answer the following questions:

RQ 1: What are the research trends on industrial classes in vocational high schools over the past 10 years?

RQ 2: What factors influence the effectiveness of industrial classes on graduates' job readiness?

RQ 3: What are the challenges and obstacles in implementing industrial classes?

RQ 4: How does the industrial class impact the hard skills, soft skills, and work readiness of vocational school graduates?

RESULT AND DISCUSSIONS

Research Trends on Industrial Classes in Vocational High Schools Over the Past 10 Years (RQ 1)

A search using Publish or Perish shows that the number of publications on industrial classes in vocational high schools over the past ten years remains very limited. From 2015 to 2019, no articles were found specifically addressing this topic, while from 2020 to 2024, only eight relevant articles were published. A significant spike occurred in 2024, with four studies focusing on the implementation and effectiveness of industrial class programs (Bramantiya & Nurhadi, 2024; Sari et al., 2024; Sulton & Sumiati, 2024; Widayanti et al., 2024). These findings indicate that the concept of industrial classes has only gained scholarly attention in recent years, along with the increasing need for synchronization between vocational education and the world of work.

Most studies discuss the application of industrial classes in various fields of expertise such as welding engineering, software engineering, and automotive engineering (Achsani et al., 2020; Garnadi et al., 2022; Rojaki et al., 2021). All studies were conducted in vocational high schools (SMK) both public and private in Indonesia. Interestingly, only one article explicitly highlights the relationship between industrial classes and students' job readiness, by (Anitasari et al., 2022). This indicates a research gap and also an opportunity for further research to examine the relationship between industrial classes, graduate competencies, and job absorption in the industrial world.

Factors Influencing the Effectiveness of Industrial Classes on Graduates' Employability Readiness (RQ 2)

A literature review reveals that the effectiveness of industrial class programs on graduates' employability is strongly influenced by internal and external factors. The primary factor supporting the program's success is a close partnership between schools and industry (Bramantiya & Nurhadi, 2024), followed by curriculum alignment with industry needs, teacher quality, competency certification, and ongoing training (Sari et al., 2024). Effective collaboration between vocational schools and industry has been shown to improve students' technical skills, strengthen self-confidence, and expand employment opportunities through internships and on-the-job training.

Furthermore, research demonstrates the importance of student motivation and mental readiness in determining program success. (Widayanti et al., 2024) highlighted that some industrial class students still hesitate to apply for jobs at partner companies due to their perceptions of high workloads and disciplinary standards. These psychological factors need to be addressed through career guidance and character development to better prepare students for the industrial world. The results of other studies emphasize the need for the implementation of competency-based education to ensure a match between students' skills and job market demands (Sulton & Sumiati, 2024).

Challenges and Barriers to Industrial Class Implementation (RQ 3)

The implementation of the industrial class program in vocational high schools faces various multidimensional challenges (Bastiana et al., 2022). The most prominent obstacles are limited human resources (teachers and students), infrastructure, and funding that does not fully meet industry standards (Garnadi et al., 2022; Sari et al., 2024). Students' unpreparedness for the world of work and low levels of productive competency are also major inhibiting factors. Furthermore, a lack of commitment from industry and weak coordination between schools and partners contribute to suboptimal program implementation (Rojaki et al., 2021).

Several studies have identified specific obstacles, such as the curriculum synchronization process, delays in signing Memoranda of Understanding (MoUs), the implementation of On-the-Job Training (OJT) for teachers, and the ineffective establishment of teaching factories (Achsani et al., 2020; Rojaki et al., 2021). Weak evaluation and monitoring systems also make it difficult to maintain the quality standards of industry-based learning. These challenges demonstrate the need for sustainable management strategies, thorough planning, and government policy support to ensure the sustainability and effectiveness of industrial class implementation in vocational schools.

Impact of Industrial Classes on Hard Skills, Soft Skills, and Job Readiness of Vocational High School Graduates (RQ 4)

The study results indicate that industrial classes have a significant positive impact on improving the hard skills and soft skills of vocational high school students. This program strengthens technical skills through hands-on experience in industry and project-based training (Bramantiya & Nurhadi, 2024; Garnadi et al., 2022). Furthermore, students also experience improvements in soft skills such as communication, discipline, teamwork, and adaptability in the workplace (Anitasari et al., 2022). The study showed that the average job readiness score for industrial class students reached 86.13%, indicating the program's high effectiveness in preparing competent and competitive graduates.

Industrial classes also play a crucial role in shaping students' work character by fostering a work ethic and professional responsibility. Through direct interaction with industry practitioners, students learn to navigate the dynamics of the real world of work (Sulton & Sumiati, 2024; Widayanti et al., 2024). Collaboration between schools and industry has proven effective in bridging the gap between theory and practice, while simultaneously enhancing students' self-confidence and mental preparedness. Overall, the industry class program is an effective strategy for

improving the quality of vocational school graduates, preparing them to face the challenges of the workplace in the era of the Fourth Industrial Revolution.

CONCLUSION

The results of a systematic review indicate that industrial class programs in vocational high schools have a significant impact on improving graduates' hard skills, soft skills, and job readiness. The eight articles analyzed show that research on this topic is still limited, with a surge in publications only seen after 2022. This indicates that the issue of industrial classes is still relatively new and requires further in-depth study, particularly in relation to student job readiness. The success of this program is inseparable from several key factors, such as close collaboration between schools and industry, curriculum alignment with industry standards, teacher competence, facility availability, ongoing training, and structured internship access. Furthermore, student motivation and understanding of career prospects also determine the program's effectiveness. However, the implementation of industrial classes still faces challenges, ranging from limited human resources, facilities, and funding to suboptimal curriculum synchronization and commitment from industry. Students' mental readiness and enthusiasm for entering the workforce also require special attention. Overall, the empirical findings confirm that industrial classes not only improve technical skills but also build soft skills such as communication, teamwork, discipline, and work ethic. This program also acts as a bridge between the world of education and the needs of industry, making it an important strategy to strengthen the competencies of vocational school graduates and increase their competitiveness in the modern industrial era.

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