A Systematic Review: Habituation of Industrial Work Culture in Supporting the Employability of Vocational Students in the Field of Engineering Technology

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ABSTRACT

Vocational High Schools (VHS) as providers of industrial labor, are required to form graduates who have technical skills *(hard skills)* and non-technical *(soft skills)*. VHS in the field of engineering technology prepares students to work in the industrial sectors of manufacturing, construction, automotive, energy, heavy equipment maintenance, and automation system operators. Student work readiness is a key element in the success of VHS education, particularly in the fields of Technology and Engineering, which require specific skills, mental resilience, and adaptability to industrial culture. For this reason, habituation to industrial work culture is important in supporting students' work readiness. This study aims to systematically review the literature related to the habituation of industrial work culture in supporting work readiness, vocational students. The PRISMA method was employed in this study through the stages of database selection, initial selection based on the suitability of the article title, relevance evaluation through abstract and keyword analysis, and final screening by eliminating articles that did not meet the criteria and determining which articles would be analyzed further. The results of this study show that the implementation of industrial work culture is carried out through various approaches, including the Teaching Factory program, Industrial Work Practices (Prakerin), an industry-based curriculum, and the internalization of values such as 5S/5R and Occupational Health and Safety (K3). The main values developed include technical skills, discipline, work ethic, integrity, teamwork, honesty, punctuality, innovation and mastery of soft skills. Teachers and schools have the main role in fostering this culture through contextual learning, collaboration with industry, and creating a learning environment that mirrors the world of work. In conclusion to this literature review, systematic habituation of industrial work culture is crucial for producing competent VHS graduates who have an advantage in job competition.

Keywords: habituation, industrial work culture, work readiness, soft skills, vocational students, systematic literature review

INTRODUCTION

Vocational and vocational education is primarily aimed at preparing students to become a competent workforce in the business and industrial world (Sudira, 2012; Cahyadi, 2018). The objectives of vocational education encompass three key elements: work skills, good character to foster independence *(life skills)*, and career development opportunities through vocational education (Sudira, 2018). Based on the spectrum of expertise, VHS in Technology and Engineering encompasses several specialized programs, including Automotive Engineering, Construction and Property Engineering, Electrical Engineering, Mechanical Engineering, Industrial Engineering, Shipbuilding Engineering, and Electronic Engineering (Kepmendikbudristek, 2024) . Graduates in this field are directed to work in various industrial sectors including manufacturing, construction, automotive, energy, and automation systems, among others.

However, what is still a challenge is that graduates of vocational education, especially Vocational High Schools (VHS) still face doubts from the world of work regarding their ability to apply the knowledge and skills acquired during the education period, so that the labor does not fully recognize their level of readiness. Data from the Central Bureau of Statistics (BPS, 2022) also indicates that the level of work readiness of VHS

graduates still needs to be improved in order to meet the demands of an increasingly competitive labor market. Research results indicate that the unemployment rate among VHS graduates remains high, ranging from 15% to 25% in various regions (Yuniarsih, 2018; Rifma, 2024; Anas Arfandi, 2024) . This condition highlights the need for targeted improvement efforts in vocational education, ensuring that graduates are truly prepared to enter the rapidly evolving world of work. Moreover, the 4.0 revolution requires a workforce with specific skills, such as critical thinking, problem-solving, the ability to think about how to think (metacognitive), communication skills, teamwork, creativity in innovation, and mastery of literacy (Mardiyah et al, 2021).

The increasing urgency to prepare work-ready VHS graduates is a response to the increasingly competitive and rapidly changing industrial landscape. The development of industry 4.0 and the digitalization process encourage the vocational education system to adapt, both in terms of curriculum and learning methods, to suit the needs of the business world and industry (Kertiasih, 2024; Susanti, 2024). Competency-based vocational education is an important tool in preparing students with relevant technical skills (hard skills) and non-technical skills (soft skills) (Indrawati, 2023; Sulistiobudi, 2023) .

VHS as a provider of industrial labor must focus on student character-building based on the concept of work culture (Yoto, 2019) . This is important so that VHS graduates can apply these principles in the workplace later. Although a number of efforts have been made to align vocational education with the world of work, such as *link and match* programs, Dual System Education and *Teaching Factory* programs, major challenges are still encountered, especially in integrating work culture values into the learning process. Various studies on industrial work culture in vocational schools have been conducted in both national and international journals. Culture can be understood as a set of values and beliefs that are interconnected with members, organizational governance, and supervisory mechanisms, thereby forming prevailing beliefs and values (Tika, 2005) . In other words, culture can be interpreted as a pattern of habits or traditions that are carried out repeatedly. Meanwhile, the term ‘work’ can be literally interpreted as an activity carried out by someone to generate income and meet life’s needs. Work culture refers to a set of habits, systems, and values that served as guidelines and are continuously practiced by employees whitin an organization (Nawawi, 2003; Mangkunegara, 2005) . Although some do not have formal sanctions for breaking them, the entire organization morally agrees that these habits must be obeyed as part of the job in order to achieve common goals.

Previous research findings indicate that the process of habituation to work culture has a positive impact on student employment (Inderanata, 2023) . A research result shows that the ability to develop soft skills is proven to contribute positively to individual readiness to work. Additionally, 5S work culture affects work readiness (Maulidina, 2023) . The results of research conducted in Mexico provide an overview of the relationship between 5S and other programs, known as Lean-Kaizen, in the organization studied (Barraza, 2012). The results of the literature review by Mulyani and Djatmik (2019) outline the work characteristics demanded by the industry are communication, responsibility, cooperation, environmental awareness, occupational safety and health (K3) awareness, negotiation, problem-solving, analysis, innovation, critical thinking, flexibility, decision making, leadership, and discipline. However, most students have not fully demonstrated professional work attitudes and work habits can be embedded in the curriculum and learning practices in SMK (Indrawati, 2023; Yuniarsih, 2018) . In addition, various research results indicate that many graduates fail to meet the work readiness standards necessary for sustainable success in the professional world (Casner-Lotto, 2006) .

Many previous studies have addressed the issue of work readiness, but they often focus more on technical aspects without examining in depth the importance of familiarization with work culture. For example, research on the influence of interpersonal and communication skills on work readiness shows that these aspects are very important, but have not received much attention as part of the habituation strategy (Fatwa Tentama, 2019; Indrawati, 2023) . Other research on industrial work practices also reveals that direct experience in the world of work contributes significantly to graduate readiness (Inderanata S. &., 2023; Yuniarsih, 2018) .

Based on the description above, that the application of industrial work culture in SMK plays an important role in producing graduates who not only have technical skills, but also character and work ethic in accordance with the needs of business and industry. The cultivation of relevant work culture values, such as discipline, responsibility, collaboration, as well as the 5S, Kaizen, and Lean Management work culture, is important to be understood and internalized since school education. Therefore, it is necessary to have a deep understanding of

the types of industrial work culture and how their implementation can be effectively integrated into the learning process in SMK, both through the curriculum, practical activities, and daily habituation in the school environment.

This research aims to fill this gap by examining in depth how work culture habituation affects the employability of vocational students. Using a systematic approach, this study aims to identify key factors that can support the creation of a strong work culture in the vocational education environment. By focusing on work culture habituation, this study aims to enrich the scientific discourse in the field of vocational education and help formulate curriculum strategies that are more adaptive and contextual in preparing graduates for the realities of work.

LITERATURE REVIEW

Types and Characteristics of Industrial Work Culture

Industrial work culture reflects the values of critical thinking, negotiation, communication, leadership, and integrity applied through honest and responsible behavior, the value of professionalism implemented by implementing K3 procedures, the value of productivity shown by the specified time and quality targets, and the value of innovation and competitiveness (Sukardi et al, 2019; Mulyani, 2019). In addition, the industrial work culture applied in manufacturing, automotive, healthcare and culinary fields is Kaizen culture, 5S Work Culture (Seiri, Seiton, Seiso, Seiketsu, Shitsuke), (Kirani C. I., 2023; Srinivasan, 2016; Di Barra, 2002) . The implementation of 5S culture significantly contributes to the progress of productivity, effective space utilization and work safety (Randawa, 2017) . K3 work culture and 5S work culture are industrial work cultures that are integrated in the curriculum of productive subjects in VHS, especially in the field of Engineering Technology. In VHS, this work culture is adopted through programs such as *teaching factory*, industrial work practice (Prakerin), and project-based learning. Industrial work culture consists of discipline, hard work, honesty, responsibility, and high motivation, (Arhamni Hamid, 2024) , character education is obtained by students through Pancasila and Citizenship Education subjects and through the Pancasila student profile strengthening project.

The form of application of industry-based work character in learning at VHS can be in the form of increased student participation and learning achievement. Research reveals that the consistent implementation of industrial culture is proven to improve achievements in practical work. This increase can be seen from two aspects: discipline, and the results of practical work that show an improvement in the timeliness and quality of the products produced (Sudiyanto, 2018) . The (Wahjusaputri et al., 2024). *link and match* program in Indonesia, which has been an idea since 1989, aims to align the workforce well with the demands of the workforce In this program, students undergo work-based learning directly (Wustqo et.al, 2020; Mardjanto, 2021). As in SMKN 2 Bandung, which collaborates with PT Komatsu, in this partnership, PT Komatsu integrates various industrial work culture systems into the Welding Engineering class learning curriculum, namely 5S (Seiri, Seiton, Seiso, Seiketsu, Shitsuke), 3C (Concern, Cause, Countermeasure), Horenso and Yoss Check (Gugum, 2020) .

Implementation of Industrial Work Practices and Student Job Readiness

Industrial Work Practices (prakerin) is one form of implementing a dual education system, a breakthrough in the VHS curriculum. In this program, students undergo training in the industrial world by their field of expertise (competence) for a predetermined period of time (Fridaus, 2012) . Gulo (1984) defines readiness as a stage of individual maturity that enables an individual to accept and carry out a certain behavior. Meanwhile, Chaplin (2006, p.4) defines readiness as the level of a person's maturity that enables them to carry out an action. Many studies show that Industrial Work Practices provide students with direct experience in facing real-work challenges, which affects their work readiness. A study reveals a significant positive correlation between practical experience and work readiness, with a contribution of 24.4%. Additionally, the effect of soft skills on work readiness is also found to have a positive relationship with work readiness with an effect of 24.5% (Diana, 2021) . The results of the study revealed that student involvement in Field Work Practices (PKL) increased work readiness, with the finding that the experience explained approximately 32.7% of the

variability in student work readiness (Isnania, 2015; Supriani, 2019) . Findings from Agia Seriana, (2021) also reinforce this, showing a significant positive relationship between PKL experience, and understanding of the world of work, as well as their readiness to work. In line with the results of research by Lia Yuliani, (2019) revealed that industrial work practices and academic achievement provide significant benefits for students. Through work-based training programs, students gain practical experience that shapes their personal development while developing vocational skills that are relevant to specific career fields.

Contribution of Industrial Work Culture to Student Job Readiness

The implementation of work culture in the vocational education environment is expected to shape students' work habits. Thus, when entering the industrial world, they have adapted and are able to integrate with the work culture that applies in the professional world (Wijanarka, 2023) . According to (Khumalo, 2019) implementation of the 5S work culture provides a variety of significant benefits, including increased cleanliness of the workshop area, reduced risk of hazards, safe storage systems, and efficient space utilization. The results of research by Wijanarka, (2023) showed that the implementation of the 5S work culture had a significant positive impact on increasing work readiness, contributing 15.90%. In addition to the 5S culture, the *Teaching Factory* (Tefa) program is one of the means of integrating industrial work culture into learning at VHS. According to (Suciani, 2023) , the implementation of the Teaching Factory at SMKN 3 South Tangerang focuses on developing student skills through project-based activities designed to resemble conditions in the industrial world. Meanwhile, the VHS Center of Excellence (COE) program also has the aim of improving the quality of education to be in line with industry needs, although its implementation still faces various challenges (Mahfudi, 2021) .

Contribution of Discipline and Responsibility to Job Readiness

Work discipline is a reflection of an obedient attitude towards applicable rules and regulations. Rois and Erlangga (2023) stated that the use of a contextual teaching learning (CTL) approach in the educational process can foster students' attitudes of discipline and responsibility which contribute to improving their work ethic. The cultivation such as discipline, responsibility, and punctuality in the school environment plays a crucial role in shaping the work ethic of vocational students. Work ethic has a fundamental relationship with internal attitudes and values that are formed through the habituation of discipline, responsibility and punctuality. Study results reveal that an educational environment that consistently applies the values of discipline and responsibility has the potential to improve students' work ethic, thereby preparing them better to meet the challenges of the industrial world (Sartika, 2022) . Another study conducted by (Harmant, 2024) that work ethic has a positive and significant effect on performance through discipline. A study conducted on workers, found that discipline and work ethic significant impact on employee performance (Aria, 2024; Javed, 2021) .

Research Questions

This research will focus on the following research questions:

1. How is industrial work culture implemented in vocational schools?
2. What are the most dominant industrial work culture values that shape the work readiness of vocational students?
3. How do teachers and schools form industrial work culture habituation through learning?
4. What are the challenges faced in implementing industrial work culture in vocational schools to improve students' work readiness?

METHODS

Protocol and Registration

The approach applied to answer this research question is the Systematic Literature Review (SLR) method

through the selection of relevant articles based on predetermined criteria. This SLR process was carried out referring to the framework developed based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) principles. The PRISMA diagram is applied as a systematic guide in selecting literature through four main phases: 1) source identification, 2) initial screening, 3) eligibility assessment, 4) final determination of documents that met the inclusion criteria.

Figure 1. PRISMA Flow of Steps

The search is conducted by entering specific keywords in journal databases such as Google Schoolar, Semantic Schoolar, PubMed, and Scoopus.

Illegibility Criteria

To obtain data that meets the research objectives, inclusion criteria and exclusion criteria are needed to eliminate inappropriate articles. The following inclusion criteria were used. The inclusion criteria of this study include: 1) articles published between 2016-2024; 2) studies relevant to work culture in SMK or vocational education; 3) articles in English. While the exclusion criteria include: 1) the fields studied are Arts and Humanities, Health Professions, Computer Science, Medicine, Environmental Science, Nursing, Mathematics, Economics, Econometrics and Finance, Decision Sciences, Energy, Materials Science, Earth and Planetary Sciences, Dentistry, Chemical Engineering; 2) document type book chapter, review.

Table I: Article selection criteria

General Criteria	Acceptance Criteria	Rejection Criteria
Year of publication	2016-2024	2015 and earlier
Document type	Journal article	thesis, book, literature review article
Language	English	Other languages
Field of study	**Scopus** Subject areas: Social Sciences, Education	1) The fields studied are Arts and Humanities, Health Professions, Computer Science, Medicine, Environmental Science, Nursing, Mathematics, Economics, Econometrics and Finance, Decision Sciences, Energy, Materials Science, Earth and Planetary Sciences, Dentistry, Chemical Engineering;

Search

The first step is to select the source database. The databases used in this systematic literature review included Google Schoolar, PubMed and Scoopus. The primary and Boolean keywords used in the search were “work AND culture, AND work AND habit OR 5s OR work AND ethics OR habituation OR work AND culture AND industry OR vocational AND education.” The journals searched were categorized from 2016 to 2024. The literature search strategy is based on the Scopus database. Articles that match the keywords are, then selected and those that do not match the keywords are eliminated.

Study Selection

At this stage, the number of articles obtained was 1538 articles from Publish or Perish with the Google Schoolar database, 200 articles and PubMed 1000 articles, while in Scopus, 286 documents were found and 52 semantic Scholar articles were found. The number of selected articles is 22 articles published in 2016-2024.

1) The article selection process is based on the following stages:

Stage 1: The process of identifying database sources was carried out based on the keywords found, and at this stage 1538 articles were netted.

Stage 2: Article identification was carried out based on the suitability of the title with the research topic, and 131 articles were selected.

Stage 3: selection of articles based on the suitability of abstract content and keywords resulted in 52 articles

Stage 4: This stage is the final filtering process, namely by eliminating articles that do not match the predetermined search criteria. At this stage, 22 articles were identified. The distribution of the number of articles from 2016 to 2024 is shown in Figure 1.

Data Collection Process and Data Items

The article curation process included 1) data organization using Excel, 2) non-duplication verification, 3) selection based on period and title relevance, and 4) in-depth content analysis with reference to the research questions (Tudy et al., 2023).

RESULTS

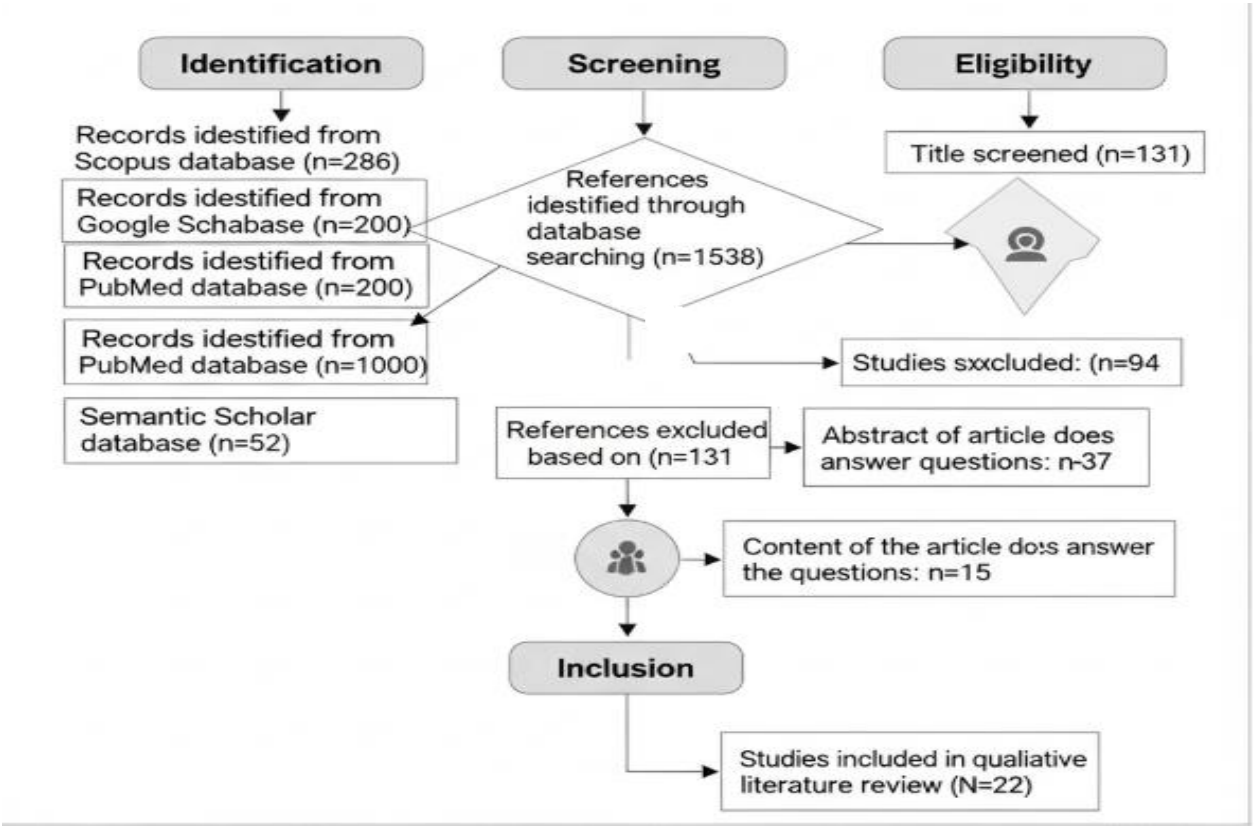

Figure 1: PRISMA Flow Diagram of Search Screening (Inclusion and Exclusion) on the Review

This literature review focuses on the effect of industrial work culture habituation on work readiness, work habits, and work ethic of vocational students. In this study, we analyzed seven scientific articles. We categorized the findings into three sub-themes, namely: 1) Implementation of Industrial Work Culture in Vocational Schools; 2) The Role of Industrial Work Implementation and Industrial Work Practices in Shaping Job Readiness; 3) Obstacles and Challenges in the Implementation of Industrial Work Culture. The articles reviewed in Tables 1, 2 and 3 all support and answer Research Questions 1 to 4.

The approach was based on 22 articles obtained from three leading data base sources : SCOPUS, Semantic

Scholar, and Google Schoolar. Data was collected by extracting information from each review article based on publication type, year of publication, language, title and abstract. All data were entered into a table compiled using Microsoft Excel software. The analysis process was conducted by utilizing a table to group articles according to specific categories, thereby answering the research questions. The results of this analysis will be displayed in tabular format. Table 2 lists 22 research articles and their authors. All articles analyzed have been selected based on the inclusion and exclusion criteria that have been applied previously.

Table II: Articles based on the established acceptance and rejection criteria

No	Author	Year	Tittle
1	Pambayun N.A.Y.; Munadi S.; Arifin Z.; Setiawan C.; Retnawati H.	2023	Industrial Work Culture Education in Indonesian Vocational High Schools: Teachers' Perceptions and Practices
2	Sukardi T.; Fitrah A.; Syauqi K.; Paryanto	2020	Industrial Working Culture in Learning Practice at Vocational High School
3	Yoto a, Marsonoa, Agus Suyetnoa, Puteri Ardista Nursisda Mawangia, Achmad Romadin a and Paryono	2024	The Role of Industry to Unlock the Potential of the Merdeka Curriculum for Vocational School
4	Cahya Kirani, Rohmatun Lukluk Isnaini, Agil Amirus Sholichin, Ahmad Naufal Gumilang, Fitrianingsih	2023	5S Culture of Excellence in Facilities and Infrastructure Management in Higher Education Institutions
5	Maulidina, A., & Wijanarka, B. S.	2023	Analysis of Work Readiness Based on Soft Skills, Machining Knowledge, and 5S Work Culture
6	Chatigny C.	2022	Occupational Health and Safety in Initial Vocational Training: Reflections on the Issues of Prescription and Integration in Teaching and Learning Activities
7	Hoekstra, Annemarieke	2023	Departmental Conditions for Professional Learning of Instructors in Vocational and Professional Education
8	Sutiman S.; Sofyan H.; Arifin Z.; Nurtanto M.; Mutohhari F.	2022	Industry and Education Practitioners' Perceptions Regarding the Implementation of Work-Based Learning through Industrial Internship (WBL-II)
9	Wahyudi; Sharon; Pambudi, Nugroho Agung	2023	Evaluating the Vocational School Graduate's Work-readiness in Indonesia from the Perspectives of Soft skills, Roles of Teacher, and Roles of Employer
10	Suhartini R.; Ramadhani B.Y.A.; Wahyuningsih U.	2024	Improving Teaching Factory Performance by Work Culture in Vocational Learning
11	Dahlback J.; Olstad H.B.; Sylte A.L.; Wolden A.-C.	2020	The importance of authentic workplace-based assessment: A study from VET teacher education
12	Sayuti, M., Susanto, H.A., Hasanah, N., Biddinika, M.K., Wadiyo, W., Opwora, M.C., Kamis, A., & Rokhmah, N.	2024	Enhancing Safety Culture in Vocational Education: Insights from Industrial Workshops
13	D. Brata, A. Imron, Ahmad Sonhadji K.H, Imron Arifin	2017	Headmaster Leadership Behavior in Strengtening Character Values in Vocational High School
14	Antje Barabasch, A. Keller	2019	Innovative Learning Cultures in VET - 'I generate

			my own projects.'
15	Yoto, Marsono, A. Suyetno, P. A. N. Mawangi, Achmad Romadin, Paryono	2024	The Role of Industry to Unlock the Potential of the Merdeka Curriculum for Vocational School
16	Azizah N. Diana, Supari Muslim & Mochamad Cholik	2021	The Correlation of Industrial Work Experience and Soft Skills on Work Readiness of Graduated of Vocational High School
17	Inderanata, N. Rohmad, Thomas Sukardi	2023	Investigation Study of Integrated Vocational Guidance on Work Readiness of Mechanical Engineering Vocational School Students
18	Tafakur, Samsul Hadi, Zainal Arifin, Sudji Munadi1	2024	The Role of Industrial Internships in Developing Work Self-Efficacy for Automotive Engineering Students
19	Bambang Sudarsono, Prabandari Listyaningrum, Fatwa Tentama3	2024	Developing learning and training within industry model to improve work readiness of vocational high school students
20	Mahmudah, Fitri Nur, Baswedan, Aliyah Al Ganis Rasyid, Usman, Husaini, Mardapi, Djemari, Putra, Eka Cahya Sari	2022	The Importance of Partnership Management to Improve School-to-Work Transition Readiness Among Vocational High School Graduates
21	Billett, Stephen	2018	Student Readiness and the Integration of Experiences in Practice and Education Settings
22	Putriatama, Ega, Syaad Sugandi R.M.	2016	Work Readiness by Vocational School Graduates Viewed from Industrial Work Practice's Experience and Vocational Skills

Study Findings

Article on Industrial Work Culture Habituation to Support Vocational Education Students' Work Readiness

As a result of the data extraction and synthesis process, 22 articles that discuss the habituation of industrial work culture in order to support the work readiness of vocational education students have been classified into four main categories based on the themes raised. Based on Table III, the four categories are:

1. Integration of Industrial Work Values and Culture in Curriculum and Learning Practices
2. Industry-based Learning and Real Work Environment Simulation
3. School and Industry Partnerships for Work Culture Transfer and Readiness for World of Work transition
4. Evaluation of Work Readiness Based on Work Culture and Professional Competencies

Table III Articles on industrial work culture habituation

No	Category	Focus of Industrial Work Culture Habituation	
1	Integration of Industrial Work Values and Culture in Curriculum and Learning Practices	Integration of industrial values (discipline, teamwork, responsibility) in the curriculum	Pembayun et.al. (2023); Sukardi et.al. (2020); Maulidina & Wijanarka (2023); Suhartini et.al. (2024); Sayuti et.al. (2024); Abikenova et.al. (2023); Dahlback et al (2020); Brata et al. (2017)

2	Industry-based Learning and Real Work Environment Simulation	Real work practice, internship, teaching factory, project-based simulation	Sutiman et.al. (2022); Tafakur et.al. (2024); Rochmad & Sukardi (2023); Sudarsono et.al. (2024); Putriatama & Sugandi (2016); Shatigny (2022)
3	School and Industry Partnership for Transfer Work Culture	Industry-school cooperation, world transition work, strengthening 5S	Mahmudah et.al. (2022); Billet (2018); Yoto et.al. (2024); Kirani et.al. (2023); Barabasch & Keller (2019); Hoekstra (2023)
4	Evaluation of Work Readiness Based on Work Culture and Competencies	Assessment of student work readiness based on competencies and industrial work culture	Mosakul et.al (2025); Sayuti et.al. (2024); Maulidina & Wijanarka (2023); Inderanata & Sukardi (2023); Yoto et.al (2024)

Literature Classification and Analysis

To provide a structured view of the focus and contribution of the various studies, the relevant literature was grouped into four main categories according to the theme of industrial work culture habituation. These groupings are summarized in table 3.1, which illustrates the various approaches to integrating work culture in vocational schools, including: 1) Integration of industry values into the curriculum; 2) Industry-based experiential learning; 3) Partnerships between schools and the world of work, and; 4) Evaluation of students' work readiness level.

Furthermore, this classification is examined in depth with reference to the four questions that have been formulated. Each question addresses 1) the Implementation of industrial work culture in vocational education, 2) key values that shape graduates' work readiness, 3) The role of education and school institutions in the process of work culture habituation and, 4) Obstacles in the implementation of the habituation. The results of this analysis are presented in Table IV to show the relationship of each literature question asked.

Table IV. Criteria for each literature

No	Group	Focus of Findings	Researcher
1	Implementation of Industrial Work Culture in Vocational Schools	The implementation of industrial work culture in SMK varies, including 5S practices, discipline, teamwork, and punctuality, and behaving honestly, innovatively, and responsibly. The approach is carried out through teaching factories, work-based learning through the implementation of industrial internships, curriculum integration, and industrial work character-based management. Implementing a work culture that suits the industry can be achieved in the first step, namely through a memorandum of understanding (MoU).	Pembayun et.al. (2023); Sukardi et.al. (2020); Yoto et.al. (2024); Sudarsono et.al (2024); Brata et.al. (2017); Sayuti et.al. (2024); Sutiman et.al. (2022); Barabasch & A. Keller (2019); Wahyudi et.al (2023); Mahmudah et.al. (2022); Putriatama, et.al (2016); Azizah et.al (2022)
2	Dominant Industrial Work Culture Values to support student work readiness	In addition to knowledge, attitudes and technical skills that support work readinessother values contribute, namely 5S (Seiri, Seiton, Seiso, Seiketsu, Shitsuke), integrity, productivity, soft skills (communication, responsibility), work safety (K3) and professionalism. Work practice experience has a significant effect on work readiness. The implementation of apprenticeships	Putriatama, et.al (2016), Maulidina & Wijanarka (2023); Kirani et.al. (2023); Sukardi et.al. (2020); Abikenova et.al. (2023); Chatigny (2020); Sayuti et.al (2024); Sutiman, et.al (2022);

		in industry called Prakerin is an opportunity for students to master skills, increase efficiency, productivity, and professionalism.	Wahyudi, et.al. (2023); Azizah et.al. (2023)
3	The Role of Educators and Schools in Work Culture Habituation	Teachers act as facilitators of work culture through contextual learning, industry simulation, work ethic habituation, and work character cultivation, preparing students to engage in workplace experiences. Schools reinforce the culture through industry collaboration and curriculum adjustments. Character education can be through self-development, faith-based learning and the application of innovative learning models. The results reveal that work culture has a significant and positive effect on teacher performance, this shows that by increasing teacher performance, learning will be more meaningful.	Pembayun et.al. (2023); Yoto et.al. (2024); Mosakul et.al. (2025); Hoekstra (2023); Suhartini et.al. (2024); D. Brata et.al (2017); Billet, Stephen (2018).
4	Challenges of Industrial Work Culture Implementation	Challenges include a lack of supporting facilities, a school-industry culture gap, limited teacher competence, administrative burden, inadequate regulatory support, and low industry participation. The role of leadership and joint commitment in shaping work culture is also a challenge in implementing of work culture habituation.	Pembayun et.al. (2023); Yoto et.al. (2024); Tafakur et.al. (2024); Mahmudah et.al. (2022); Hoekstra (2023); Chatigny (2022); Kirani et.al. (2023); Sudarsono et.al. (2024)

DISCUSSION

Implementation of Industrial Work Culture in Vocational High Schools

Various studies have shown that VHS adopt an industrial work culture through various approaches and activities. Two main programs that play an important role in shaping students' work ethic are Teaching Factory (simulation of industrial environment in schools) and Industrial Work Practices (Prakerin) (internships in real companies) (Sutiman et.al, 2022; Tafakur et.al, 2024; Mahmudah et.al, 2022). In addition, VHS also adjusts its curriculum to industry standards, for example, through collaboration with the automotive sector to integrate the development of both shoft and hard skills needed in the workplace.

Not only that, industry values are also instilled through daily habituation, such as the application of the 5S/5R principles (Ringkas, Rapi, Resik, Rawat, Rajin) in learning activities. These steps are designed to ensure that VHS graduates possess competencies and work attitudes that align with industry demands.

The following is a form of implementation of industrial work culture in SMKs:

1. Teaching Factory: schools provide production-based learning facilities, mimicking the real workflow of the industry.

2. Internship Program (Prakerin): Students gain hands-on experience in the company to hone their skills and professionalism (Putriatama, et al, 2016; Barabasch & Keller, 2019; Sutiman, et al, 2022; Mahmudah et al, 2023).

3. Industry-Based Curriculum: Learning materials are aligned with industry needs, including technical aspects and character development (soft skills) (Wahyudi et.al, 2022).

4. Work Character Formation: Consistent application of values such as 5R.5S and other professional habits in school activities

5. Implementation of Occupational Health and Safety (K3) culture (Sayuti et al, 2023): K3 culture can be implemented by students both at school and during their internship (Prakerin), work culture in the industry greatly affects the ability of students to implement it during Prakerin implementation.

Core Values of Industrial Work Culture that Support Job Readiness

Based on the literature review, several fundamental values serve as the main pillars in shaping industrial work culture in SMK. Technical competence, discipline, and work professionalism emerge as the main components that must be emphasized. Research results indicate that internship experience has a positive influence on student self-efficacy (Tafakur, et al 2024), suggesting it also impacts student work readiness.

The main values that are developed:

1. Technical Skills (Hard Skills): Mastery of specific skills according to the field of study is the main basis for the work readiness of SMK graduates.

2. Discipline and Work Ethic: The implementation of 5S/5R (Ringkas, Rapi, Resik, Rawat, Rajin) serves as the benchmark for forming an orderly and efficient culture in the school environment. Additionally, honesty values such as responsibility, and punctuality are also expected from students.

3. Occupational Safety and Health (K3): Understanding of work safety procedures is an integral part of industrial culture (Isa, 2019) ; (Sudarsono et.al,2024)

4. Soft skills: Communication skills, team collaboration, creativity and adaptation are developed through various methods including simulations and internship programs (Prakerin) (Azizah et.al, 2021; Wahyudi et.al, 2022).

5. Value Habituation through Direct Practice: The internship program has been effective in instilling industrial values, as students experience firsthand their application in the world of work.

In synthesis, the dominant values that support work readiness are technical competence in accordance with industry needs, disciplinary and professional attitudes (such as honesty, responsibility, environmental care), a 5R/5S culture to improve efficiency and productivity, and soft skills as a support for work readiness in the collaborative era. Through the internalization of these values, VHS seeks to produce graduates who are not only skilled but also brave, meeting the demands of the industrial world.

The Role of Educators and Schools in Realizing Industrial Work Culture

Teachers and schools have an important role in shaping students' industrial work culture. This is achieved by creating relevant and engaging learning methods, such as simulating industrial processes in the classroom, conducting marching activities to promote discipline, and instilling character values. In addition, the main stage that needs to be done by schools is to implement a *link and match* program by conducting MoUs with related industries (Yoto, 2024). Abikenova and Oshakbayeva (2023) found that teachers with a deep understanding of the dynamics of the world of work were able to convey work values such as discipline, integrity, and teamwork in a more contextual and relevant manner. In the literature, it is mentioned that ideal teachers function as learning managers and learning facilitators who apply industrial work culture including the 5S/5R culture. Research results indicate that industry-based learning models are effective in enhancing the work readiness of vocational students (Sudarsono et al, 2023). In addition, it is essential for vocational education to include soft skills as learning objectives, as the presence of industry instructors in the learning process will help develop these skills for work readiness (Wahyudi, et al, 2022). In addition, schools need to

create an environment that supports the implementation of industrial work culture to provide real work experience to students.

Challenges of Industrial Work Culture Implementation

The implementation of industrial work culture in VHS faces various obstacles that are both structural and cultural in nature. One of the main challenges is the lack of adequate supporting facilities such as workshops, practical equipment and industry-appropriate practice rooms. Another obstacle is the lack of regulatory support that directs the integration of industrial work culture in the curriculum and learning process (Pembayun et.al., 2023; Yoto et.al., 2024; Tafakur et al., 2024). Chatigny (2020) identifies the primary issue as a mismatch between the education system and industry needs regarding the development of work competencies. In many cases, the curriculum used in schools has not been able to align with the demands of the actual world of work, resulting in a gap between students' learning experiences and the real needs in the field. In addition, there is a lack of supporting facilities and a lack of teacher capacity to implement a comprehensive industrial work culture.

On the other hand, the low level of industry participation and involvement is a challenge in the work culture habituation process. Many industries remain passive and do not view VHS as a strategic partner in preparing their workforce. As a result, internship programs and school-industry cooperation often do not run optimally. Weak school leadership and a lack of commitment from all education stakeholders to instill a consistent work culture are also inhibiting factors. This challenge requires systemic solutions in the form of strengthening transformational leadership at the school level, establishing cooperation with industry, and policy support that accommodates the integration of work culture as a whole in vocational education (Mahmudah et al., 2022; Hoektra, 2023; Chatigny, 2022 Kirani et al., 2023; Sudarsono et.al., 2024). In response to this challenge, it is necessary to improve the curriculum, increase the capacity of educators and strengthen collaboration with industry players. Barabasch and Keller (2019) recommend an integrated approach through educational policies that encourage synergy between educational institutions and the business world.

CONCLUSION

Based on the literature analysis, vocational schools have implemented an industrial work culture through various strategies. The main approaches include Teaching Factory programs, Industrial Work Practices (Prakerin), curriculum alignment with industry needs, and habituation of professional work values such as the 5S/5R system and K3 principles. Values such as technical mastery, discipline, work ethic, integrity and the development of soft skills have proven to be an important foundation in preparing student competencies. Prakerin in particular not only plays a role in improving hard skills, but also builds confidence and understanding of the real work environment. With this approach, the industrial work culture in SMK has the potential to strengthen the alignment between the vocational education system and the demands of the industrial world.

On the other hand, the implementation of industrial work culture is still expected to face various multidimensional obstacles. Fundamental problems include limited supporting infrastructure, inadequate legal protection, and gaps between curriculum materials and the real needs of the industry. Other challenges arise from the limited industrial experience of teachers and the low involvement of the industrial world in the education process. To overcome this, it is necessary to strengthen school management, teacher capability improvement programs, and policies that encourage sustainable partnerships between SMK and industry.

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