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Implementation of Industrial Work Practices for Work Readiness in the Industry 4.0

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ABSTRACT
This study aims to describe the implementation of Industrial Internship (Prakerin) as an effort to improve students' work readiness in the industrial era 4.0 at SMKN 3 Jombang, especially in the Industrial Automation Engineering department. This study uses a descriptive qualitative approach with data collection techniques through interviews, observations, and documentation studies of students, supervising teachers, business/industrial parties (DU/DI), and alumni. The results of the study indicate that the implementation of Prakerin at SMKN 3 Jombang has been running well and is relevant to industrial needs. The activity implementation structure includes preparation, implementation, and evaluation stages that are systematically designed in accordance with book of the 2024 Revised SMK PKL Curriculum Guide. The Prakerin curriculum integrates project-based learning (PBL) and Teaching Factory (TeFa), so that students gain real work experience that supports the mastery of vocational competencies. In addition, Prakerin activities also contribute to the development of soft skills such as discipline, responsibility, communication, and adaptability to industrial work culture. However, the interview results indicate that students' work efficiency and professionalism still need to be improved, especially in the aspects of time management and professional communication. Overall, Prakerin at SMKN 3 Jombang has had a positive impact on students' work readiness, both in terms of technical knowledge, work skills, and professional character that are in line with the demands of the industrial world in the era of the industrial revolution 4.0.

***Keywords**: Industrial Work Practice; Job Readiness; Vocational Education; Industry 4.0.*

INTRODUCTION
In an era of globalization marked by rapid technological development, the industrial world is undergoing a major transformation known as Industry 4.0. This revolution integrates various technologies such as the Internet of Things (IoT), artificial intelligence (AI), and automation, transforming work practices, production processes, and workforce competency requirements. This transformation demands vocational education to prepare graduates who are adaptive, innovative, and possess skills relevant to the modern industrial world.

According to Law Number 20 of 2003 concerning the National Education System, Article 15, vocational education is secondary education that prepares students to work in specific fields. This is reinforced by Presidential Instruction Number 9 of 2016 concerning the Revitalization of Vocational High Schools, which emphasizes the importance of improving the quality and competitiveness of vocational high school graduates. One implementation of this policy is the implementation of Industrial Work Practice (Prakerin) as an integral part of the vocational education curriculum. Soleh et al. (2023) stated that Vocational High Schools (SMK) are formal educational institutions that play a vital role in producing prospective workers who are work-ready and highly competitive in the industrial world.

Prakerin serve as a bridge between formal education and the workplace by providing students with opportunities to gain hands-on experience in industry. Through these activities, students can apply theories learned in school to real-life situations, understand work culture, and develop soft skills such as discipline, responsibility, and adaptability. This aligns with research by Wulandari et al. (2025), which states that developing work-based learning methods is highly relevant to meeting the competency needs of industry in the 4.0 era.

SMKN 3 Jombang is one of the leading Vocational High Schools in Jombang Regency that focuses on developing technology and industry-based vocational education. This school has several expertise

programs, one of which is Industrial Automation Engineering (TOI), which aims to produce skilled workers in the fields of automatic control systems, electricity, and modern industrial technology. As an educational institution that supports the link and match policy between schools and the business/industrial world (DU/DI), SMKN 3 Jombang makes the Industrial Work Practice Program (Prakerin) a mandatory component of its curriculum. This is in accordance with the statement of Rahman et al. (2024) that Prakerin is considered an effective way to prepare students to face the world of work with direct experience.

The implementation of Prakerin at SMKN 3 Jombang is mandatory for all grade XII students for four to six months. This program is designed to provide real work experience in the industrial world, especially for students majoring in Industrial Automation Engineering, so that they are able to apply the theories learned in school to professional work practices. However, based on initial observations, there is still a mismatch between the location of the Prakerin implementation and the students' majors, which has the potential to reduce the effectiveness of the program in shaping work readiness according to their fields of expertise. Therefore, this study aims to analyze the implementation of Prakerin at SMKN 3 Jombang in supporting student work readiness in the industrial era 4.0.

METHOD

This study employed a descriptive research method with a qualitative approach. Qualitative research is a type of preliminary research that aims to explore broad and complex phenomena in depth (Sa'adah 2021). This qualitative research method, grounded in post-positivism philosophy, is used to examine the natural conditions of objects, where the researcher acts as a key instrument in the data collection and analysis process (Sugiyono 2013).

This research was conducted at SMK Negeri 3 Jombang, specifically in the Industrial Automation Engineering department, with a focus on the implementation of Industrial Work Practice (Prakerin) as an effort to improve students' work readiness in the industrial era 4.0. The research subjects included six grade XII students who had participated in Prakerin, two supervising teachers, one industrial supervisor (Mas Aris as the owner of the DU/DI partner), representatives of the Education Office, one alumnus who had worked in the industrial automation field, and one superior of the alumnus from the current workplace.

This study used three main data collection methods: observation, interviews, and documentation. Observations were conducted to observe the implementation of the internship in the field, interviews were used to obtain in-depth information from teachers, students, industry representatives, and alumni, and documentation was used to collect supporting data in the form of activity reports, photographs, and archives of school policies related to the internship implementation (Sa'adah 2023).

Data analysis was conducted interactively using the Miles and Huberman model, which includes four stages: data collection, data reduction, data presentation, and conclusion drawing and verification. This approach was used to gain a comprehensive understanding of the implementation of internships (Prakerin) and their impact on students' work readiness.

Data validity testing was conducted through several stages, including credibility (internal validity), transferability (external validity), dependability (reliability), and confirmability (objectivity) (Sugiyono 2013). Testing was carried out by extending observations, triangulating sources, techniques, and time, using reference materials, and conducting member checks with informants to ensure the accuracy and consistency of the data obtained.

RESULT AND DISCUSSION

Result

Implementation of Industrial Work Practice (Prakerin) at SMKN 3 Jombang

The results of the study indicate that the implementation of Industrial Work Practice (Prakerin) at SMKN 3 Jombang has been carried out systematically and in accordance with the guidelines stipulated in Permendikbud Number 50 of 2020 and the 2024 Revised SMK PKL Curriculum Guide. This program is an integral part of the vocational learning curriculum which aims to provide real work experience and foster students' work readiness before entering the industrial world.

The internship program is held for four months, specifically for 12th grade students majoring in Industrial Automation Engineering (TOI). This activity is divided into three stages: pre-internship, implementation, and post-internship. The pre-internship stage includes briefing, determining industrial locations, and signing cooperation agreements with DU/DI. The implementation stage is carried out in

partner industries such at, CV. Sahabat AC, as well as several companies in the automation and electrical fields. The post-internship stage includes evaluation, report preparation, and presentation of the results of the internship.

Based on the interview results, students admitted to gaining many new experiences during their internship. They learned about industrial automation systems, the use of work tools, and professional ethics in the workplace. This shows that internship is an effective means of connecting theory learned in school with work practices in the industrial world. According to Sari et al. (2024), effective vocational education must be able to integrate academic knowledge with real-world work experience so that students acquire competencies relevant to industry needs. This continues to emphasize the importance of close cooperation between schools and the industrial world (DU/DI) as a key factor in the success of the internship implementation. The collaboration between SMKN 3 Jombang and industrial partners such as CV. Sahabat AC owned by Mas Aris, as well as several companies in the automation and electrical fields, is key to creating relevant and applicable learning for students.

According to Paramitha et al. (2024), synergistic collaboration between vocational schools (SMK) and the business/industrial world (DUDI) significantly contributes to creating an effective learning process for students. Through this partnership, schools can adapt their curriculum to technological developments and industrial needs, while industry has the opportunity to play a direct role in developing competent and ready-to-work candidates. At SMKN 3 Jombang, this collaboration is realized through a cooperation agreement (MoU) between the school and industrial partners, which includes the provision of internship facilities, field mentors, and evaluation of student activity results.

Mr. Sulyono from the Jombang Regency Education Office emphasized that collaboration between schools and industry is a real implementation of the link and match concept in vocational education.

> *"We encourage every vocational school to establish ongoing collaboration with the industrial world, so that Prakerin activities are not just a formality, but truly provide relevant work experience for students.,"*

An interview with Mas Aris, a mentor from CV Sahabat AC, revealed that the industry also benefits from this program by identifying the potential of skilled young workers.

> *"We're happy to accept internship students because they can help with light work while studying. If we find a good candidate, we usually recommend them for further employment after graduation.,"*

Therefore, the collaboration between SMKN 3 Jombang and partner industries not only provides authentic learning experiences for students but also strengthens the vocational education ecosystem based on the needs of the workplace. This synergy creates a mutually beneficial reciprocal relationship: schools receive competency updates in line with industry developments, while industries receive trained and ready-to-contribute prospective workers. This aligns with Faishal (2024) opinion, which states that collaboration between vocational education institutions and industry is a key factor in increasing the relevance of education to job market needs. Through ongoing partnerships, schools can adapt their curriculum, learning methods, and competency standards to align with technological developments and the demands of the business and industrial world (DUDI).

Matching Major and Work Experience Place

Observations and interviews revealed that student placement in internship programs at SMKN 3 Jombang takes into account the compatibility between majors and industrial fields. Students majoring in Industrial Automation Engineering are placed in companies specializing in electrical engineering, system control, and automated industrial equipment maintenance.

According to Mr. Aris as an industrial mentor,

> "*The students already have a strong foundation in automation. They understand electrical systems, can read diagrams, and quickly adapt to work tools. So, their placement is a perfect fit for their major..*"

This statement demonstrates that the implementation of Prakerin (internship) has supported the principle of link and match between schools and the industrial world. This view aligns with Mr. Sulyono from the Education Office, who stated that matching majors and internship locations is a crucial factor in ensuring the success of Prakerin. He stated,

> "*A good vocational school must have industry partners who are relevant to its field, because if they are not relevant, students will not get experience that supports their competencies..*"

The alignment between majors and the workplace is also supported by the research findings of

Rohman (2020). Successful implementation of internships occurs when schools are able to place their students in the workplace (DU/DI) that aligns with their respective expertise programs. The higher the level of relevance between the field of expertise and the internship location, the more effective the work-based learning process is for students.

The alignment of the internship curriculum with industry needs

The internship curriculum at SMKN 3 Jombang is based on the Independent Vocational High School Curriculum, integrated with the 2024 Vocational High School Internship Curriculum Guidelines. This curriculum structure combines school learning with industrial work experience. The learning models used are Project-Based Learning (PjBL) and Teaching Factory (TeFa), where students are trained through real-world projects aligned with industry standards.F

Firna et al. (2024) menjelaskan bahwa pembelajaran berbasis proyek dan *teaching factory* mer It is an effective strategy in vocational education because it simultaneously develops both technical (hard) and non-technical (soft) skills. By implementing this curriculum, SMKN 3 Jombang has successfully created a relevant learning environment that adapts to technological developments and supports the creation of graduates who are ready to work in the Industry 4.0 era.

Prakerin supervising teacher, Mrs. Mei, explained that,

> "*Our curriculum has been adapted to industry needs, particularly for industrial automation. We offer lessons on system control, sensors, and maintenance to support field activities..*"

This is reinforced by Mr. Dani's statement, which added that Prakerin also serves as a means of strengthening work character traits such as discipline, responsibility, and professional communication. Therefore, the Prakerin curriculum at SMKN 3 Jombang not only emphasizes mastery of technical competencies but also fosters the soft skills needed in the workplace. This aligns with Agustian et al. (2024) opinion, which states that an effective vocational curriculum must balance professional competencies and industrial character to ensure students are highly competitive.

Students' Level of Understanding of the World of Work

Research results show that after participating in internships, students have a better understanding of the world of work, including organizational structures, professional ethics, and industry operational standards. They also better understand the importance of discipline, responsibility, and communication and collaboration skills.

One student stated that through the internship, he learned how the industrial system works and how each employee's role is interconnected. This experience gave him more confidence in facing the world of work after graduation.

This finding aligns with Kolb's (1984) experiential learning theory, which explains that hands-on experience in the field provides students with opportunities to learn through reflection and application of concepts in real-world contexts. Therefore, implementing internships not only provides technical skills but also enhances students' mental and social readiness for entering the real world of work.

Mr. Dani assessed that after participating in Prakerin, students became more independent and disciplined:

> "After returning from Prakerin, students become more independent, know how to work, and value time more.."

Students said they learned the importance of communication, responsibility, and teamwork in the workplace. Mas Aris, the industrial mentor, said:

> "Children quickly grasp work culture. They know when to ask questions and can work as a team, not just technically.."

This experience also has long-term impacts, as conveyed by Aripin (an alumnus of SMKN 3 Jombang) and Mr. Baktyar (an alumnus's supervisor in industry), that SMKN 3 Jombang students are accustomed to the industrial work system and are able to adapt to the production rhythm. This aligns with research by Akkas et al. (2024) which states that students will gain valuable work experience and develop practical knowledge and skills through fieldwork. Students will also learn how to search for new jobs and how to get new jobs that match their interests and abilities.

Obstacles and Aspects that Need Improvement

Although the internship program at SMKN 3 Jombang has gone well, there are still several areas for improvement. The industry supervisor stated that student work efficiency and professionalism need to be strengthened. Mas Aris stated that,

> "*The only issues that often arise are time discipline issues, such as arriving late.*

However, in terms of ability, they can follow the work well.."

This weakness demonstrates the need to accustom to an industrial work culture that demands efficiency, punctuality, and full responsibility for work results. According to Rahmawati et al. (2022), work readiness is measured not only by technical ability but also by a professional attitude and sustained work discipline.

Therefore, schools are expected to strengthen work character development and provide additional training on time management, professional communication, and work responsibilities before students are deployed to the industrial world.

Discussion

The results of this study demonstrate that the implementation of the internship program at SMKN 3 Jombang has met the objectives of vocational education, namely producing graduates with work competencies that meet industry needs. This program not only improves students' technical skills in industrial automation but also fosters disciplined, independent, and responsible work ethic.

The internship program also serves as a concrete implementation of government policy on revitalizing vocational education and the principle of linking and matching schools to the workplace. This aligns with Law No. 20 of 2003 and Presidential Instruction No. 9 of 2016, which emphasize the importance of partnerships between vocational schools and industry to improve graduate quality.

Conceptually, the results of this study support the work-based learning theory, which states that learning will be more meaningful when directly linked to real-world work experiences. Therefore, the implementation of the internship at SMKN 3 Jombang can be categorized as successful because it significantly contributed to improving students' work readiness, both in terms of technical competence and professional character.

CONCLUSION

The implementation of Industrial Work Practice (Prakerin) at SMKN 3 Jombang has been running well and in accordance with the guidelines stipulated in Permendikbud Number 50 of 2020 and the 2024 Revised Edition of the SMK PKL Curriculum Guide. This program has succeeded in connecting the theory learned in school with real practices in the industrial world, which allows students to develop technical skills as well as soft skills such as discipline, responsibility, and the ability to adapt to the world of work.

This four-month Prakerin, encompassing preparation, implementation, and evaluation, provides students with valuable hands-on experience, particularly in understanding work culture and applying technical knowledge in the field. The collaboration between SMKN 3 Jombang and the industrial sector has also proven effective in preparing students for the challenges of the workplace, particularly in the field of industrial automation.

Overall, the Prakerin program at SMKN 3 Jombang has made a significant contribution in improving students' work readiness, preparing them to adapt to the demands of industry 4.0, and strengthening the link and match between vocational education and the needs of the industrial world.

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