DIGITAL SKILL DEVELOPMENT IN VOCATIONAL LEARNING: CORE SKILLS IN VOCATIONAL EDUCATION

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Abstract - Developing digital skills in vocational learning is a strategic step to respond to the needs of an industrial world that is increasingly technology-oriented. This article discusses the importance of integrating digital skills in vocational education to formulate core skills that are relevant and adaptive to the development of industry 4.0. Vocational learning is designed and implemented to build future work skills. Vocational learning is expected to have a major impact on employment as well as career and professional development in various fields of work. The methods used in this research include literature analysis, industry needs surveys, and interviews with stakeholders in education and industry. The research results show that innovation in learning concepts is urgently needed to overcome the challenges faced by vocational education today. This research highlights the importance of developing effective vocational learning models, which are able to combine theory and practice in a balanced manner, and can be adapted quickly to technological changes. In addition, the use of digital technology in vocational learning is crucial to ensure that students are not only technically skilled but also able to compete in the digital era. This research also emphasizes that core skills that are suitable for the new world of work must be formulated by considering the needs of the industry which continues to develop.

Keywords - Digital Skill, Vocational Learning, Core Skills, Vocational Education

I. INTRODUCTION

Revitalization of education has had a significant impact on vocational education today. This process aims to optimize vocational education so that it can provide greater outcomes for vocational students. Through more focused vocational learning, students are expected to not only master technical skills, but also be ready to face the demands increasingly dynamic industry. This revitalization includes curriculum updates, improving teacher competencies, and providing more modern and relevant facilities and infrastructure (Elijah, 2021).

Thus, vocational education now functions not only as a place to hone skills, but also as a strong foundation for students in building successful career in the future. The development of vocational learning is currently faced with various major challenges, especially in facing the readiness of digital transformation, the Industrial Revolution 4.0, and the concept of Society 5.0. Digital transformation requires adaptation in learning methods and materials, where technology becomes an integral part of the education process (Qureshi, 2021). This requires the development of a more flexible and dynamic curriculum, as well as improving digital skills for teachers and students.

Vocational learning must be able to form proactive learners, namely individuals who actively facilitate and direct themselves to continue learning throughout life. In the context of an increasingly dynamic and rapidly changing world of work, the ability to learn independently and adaptively becomes very important. Proactive learners do not only wait for instructions, but also take the initiative to seek new knowledge, develop skills, and improve themselves according to industry needs and technological developments (Astar, 2021). Effective vocational education must instill the values of lifelong learning, so that graduates are not only ready to work after graduation, but are also able to continue to innovate and develop throughout their careers.

Learning intelligence is the main key in facing the changes brought by digital transformation. In an era where technology is developing rapidly and continues to change the way we work and interact, the ability to learn quickly and efficiently is very important. Learning intelligence not only includes cognitive abilities, but also involves adaptation skills, problem solving, and mastery of new technologies (Yanto, 2021). With high learning intelligence, individuals can more easily absorb new knowledge, adapt to changes, and apply relevant skills to stay competitive in an increasingly digital job market.

Therefore, education must focus on developing learning intelligence so that students are ready to face the challenges of digital transformation and succeed in an ever-changing environment. Vocational learning, which initially focused on building a solid foundation of knowledge, is now experiencing a paradigm shift towards mastering more dynamic teaching materials. This change aims to not only teach basic skills, but also equip students with the ability to build new knowledge and develop learning skills and learning self-awareness (Bahari, 2020). In this context, students are encouraged to become active learners who are able to explore, integrate, and apply knowledge independently. Mastery of teaching materials is no longer just memorization or repetition, but rather a tool to train critical thinking skills,

creativity, and self-reflection. Thus, vocational learning becomes more holistic, preparing students not only for current jobs, but also for a future full of new challenges and opportunities.

Vocational learning should focus on building core skills that are the main foundation in various fields of work, so that learning activities are truly oriented towards the skills needed by the industry. These core skills include basic abilities such as effective communication, problem solving, teamwork, and technology adaptation, all of which are essential for success in the workplace. By emphasizing core skills, vocational learning not only teaches specific technical skills, but also prepares students to face broader challenges in the world of work.

One of the most needed skills to face various challenges is digital skills. Mastery of digital skills is essential, considering that almost all industrial sectors have transformed towards digitalization. Vocational learning must proactively build digital skills as part of the core skills that students must have. By integrating technology into the curriculum, students not only learn specific technical skills, but also become familiar with digital tools and platforms that are standard in the modern workplace. Mastery of these digital skills allows students to be more adaptive, innovative, and competitive, and ready to face the dynamics of change that continue to occur in the industry

II. METHOD

The research method used in this study is descriptive analysis. This method aims to analyze and describe the efforts made to improve the digital skill in vocational learning. Using a descriptive approach, this research will collect data related to various strategies and model that have been implemented, and evaluate their impact on digital skills. Data analysis will be carried out in detail to provide a better understanding of the challenges and successes in the process of increasing digital skill, so that it can become a reference for further development in the field of vocational education.

Data collection techniques in this research were carried out through three complementary methods, namely observation, interviews and documentation. First, observations were carried out to obtain direct information about the learning process in the classroom, including how vocational teachers use technology in their teaching. This process allows researchers to witness interactions between teachers and students as well as the effectiveness of using digital tools in real-time. Second, semi-structured interviews will be conducted with teachers, school principals and other related parties, to explore experiences, views and challenges faced in improving digital skills. Through these interviews, researchers can get deeper and more varied perspectives from various informants. Third, documentation techniques are used to analyze various written sources such as curriculum, learning models and relevant activity reports. This documentation provides additional context and empirical evidence that supports the research findings. By combining these three techniques, it is hoped that the data obtained can provide a comprehensive picture of efforts to increase the digital skill of vocational education.

III. RESULTS AND DISCUSSION

Based on the results of research and discussions on vocational education, efforts to improve digital skill can be carried out as follows:

3.1. Innovation of Vocational Learning Concept in Vocational High School: Industrial Project Based Learning

Microstructure Industrial project-based learning (PbPI) is a learning approach that emphasizes the application of theories and concepts learned in the context of real projects that are relevant to the industrial world. Students are given assignments or projects to become project assistants during internships or field work practices (PKL). In an industry, a job has a project that must be worked on by professional workers. Students who do internships in the industry follow the project not only as laborers (errand boys), but also follow the existing project flow.

Starting from how is this project implemented?, how is the initial flow (drafting) of the project preparation? What are the duties of the existing professional workers? And so on. So that students get real learning that is complete and according to industry needs.

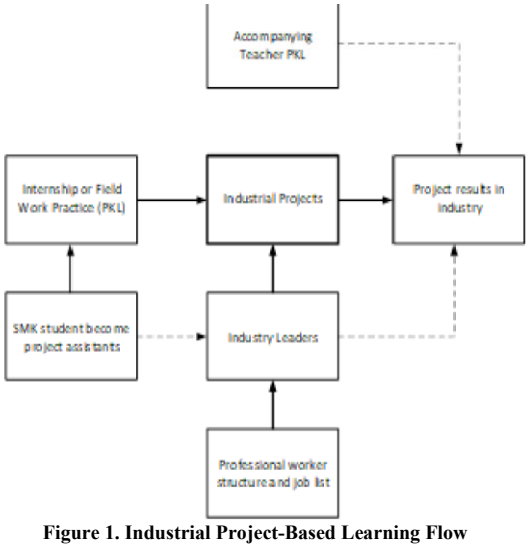


Figure 1. Industrial Project-Based Learning Flow

Vocational high school students become project assistants who participate in all series of professional work. The PKL accompanying teacher becomes a facilitator who monitors the results of the project so that it remains controlled and in accordance with the job description . Innovation in learning concepts in Vocational High Schools (SMK) with the implementation of PbPI is one method that has been proven effective in improving students' skills and readiness to enter the world of work (Potgieter, 2023).

This PbPI emphasizes the application of cognitive and skills in the real context of industry, so that students can develop competencies that are relevant to the demands of the job market. One of the innovations that can be applied in the concept of transfer of learning in vocational schools with an industrial project-based learning approach is the use of digital technology to support the learning process (Schmid, 2022).

If the project is related to technology, vocational school students will be able to construct cognitive and psychomotor skills with the application of technology. The integration of technology in learning can enrich students' learning experiences, enable access to broader information, and facilitate collaboration between students and with industry stakeholders (Gaddis, 2020). Thus, students can become accustomed to using technology that is commonly used in the world of work, thereby strengthening their readiness to enter the industry. The development of a curriculum oriented to industry needs is also an important aspect in the innovation of the concept of vocational high school learning with an industrial project-based learning approach (Melesse, 2020).

A curriculum designed with industry demands in mind will ensure that students acquire skills and knowledge that are in line with current industrial developments (Liu, 2022). This can be done through consultation with industry experts, stakeholders, and professional certification institutions to ensure that the competencies taught in vocational high schools are relevant and in accordance with industry standards. The development of innovative learning methods is also key to increasing the effectiveness of industrial project-based learning in vocational high schools (Putra, 2023).

A learning approach that emphasizes active student involvement, collaboration between students, and direct application in real industrial situations will help students develop practical skills and problem solving needed in the world of work. Learning methods such as cooperative learning, project-based learning, and experiential learning can be used to create learning tools that enhance the development of student competencies.

3.2. Effective Vocational Learning Models for Digital Skills

Square An effective vocational learning model to welcome digital skills is the integration of various digital skills training models. Blended skills training is designed to answer the need for skill development to know what work will be done (Sudira, 2024: 173). Some commonly used learning models according to Sudira (2024: 174) include: (1) Project- Base Learning Model , (2) Problems-Base Learning . (3) Production-Base Learning , (4) Work-Base Learning . (5) Teaching Factory , (6) Cooperative Learning . (7) Inquiry Model, (8) Discovery Model. These models will be analyzed and blended to determine effective learning in vocational learning. To understand the digital skills that will be crucial, it is necessary to look at current technology trends and developments that may occur in the coming decades. By 2030, it is estimated that technology will increasingly enter various aspects of human life, from work to daily lifestyle. Therefore, the digital skills needed at that time will likely be very different from those needed today. The digital skill that is predicted to be very important is artificial intelligence (AI) (Jaakkola, 2022). AI is projected to increasingly penetrate various sectors, from manufacturing to healthcare (Engel, 2021). The ability to understand, develop, and manage AI systems will be a highly sought-after skill in the job market. In addition, the ability to collaborate with AI systems and utilize them effectively will also be a very valuable skill.

3.3. Key Skills in the New World of Work

Skills that must be mastered by new professional workers (McGrath, 2019: 664). Starting from Core Work Skills , the ability to learn and adapt are two key aspects in individual success in dealing with changes and challenges in the surrounding environment. Learning is the process by which a person acquires new knowledge or skills through experience, study, or instruction. While adapting is a person's ability to adjust to changes in the environment or different situations. In this context, the ability to learn and adapt are interrelated and mutually supportive.

Generic/transferable/soft portable skills , related to cognitive abilities and soft abilities . Soft skills and worker knowledge are two very important aspects in the world of work. Soft skills refer to nontechnical skills that include communication skills, leadership, teamwork, creativity, and adaptability. On the other hand, worker knowledge includes an in-depth understanding of a particular field of work, including technical, theoretical, and practical knowledge needed to perform tasks effectively. Good soft skills can improve employee productivity, performance,

and job satisfaction (Ramadhan, 2021). For example, good communication skills allow employees to interact effectively with coworkers, superiors, and clients. Leadership skills can help in managing teams efficiently and directing them towards achieving common goals.

Transversal Skills relate to the ability to understand global citizenship and media issues information literacy . Global citizenship is a concept that has developed in the context of globalization that is increasingly uniting the world through various economic, political, social, and cultural interactions. As prospective professional workers, individuals are expected to have a deep understanding of global issues that affect their lives and society. around the world. One of the main issues in global citizenship is the economic inequality between developed and developing countries, which causes disparities in access to resources and opportunities. This issue requires collective awareness and action to create equality and justice at the global level. According to with government policy regarding SGDS.

Workplace competency is related to basic skills, especially process skills, namely critical thinking. Basic skills that must be possessed by a worker are very important in the world of work. There are a number of skills that are considered fundamental and are the foundation for a person's success in a career. One of the most important basic skills is communication skills. Good communication skills include the ability to convey ideas clearly, listen well, and interact effectively with colleagues and superiors (Ihdayani, 2021). A worker who is able to communicate well will be able to carry out his duties more efficiently and effectively. The ability to solve problems is also one of the basic skills that a worker must have. In the world of work, we are often faced with various problems and challenges that require quick and precise solutions.

Cross-Functional Skills are an important key to how someone interacts in various systems (Sudira, 2024: 68). Career success and productivity are largely determined by mastery of social skills, system skills, complex skills, problem solving skills, resource management skills , and technical skills . Crossfunctional skills are valuable assets for individuals in facing challenges and opportunities in a constantly changing work environment. With the ability to integrate knowledge and skills, individuals who have cross-functional skills can make valuable contributions to achieving common goals and advancing the industry in a better direction

3.4. Digital Technology in Vocational Learning

Powerful digital technology is digital media that creates digital skills . Digital media can make students have the intelligence to learn independently. Digital skills in finding learning resources are crucial in today's information age. With the rapid development of technology, individuals now have unlimited access to various information and learning resources via the internet. One important digital skill is the ability to use search engines such as Google, Bing, and the use of AI to find relevant information quickly and efficiently. The role of technology in educational transformation is an important issue so that the way education is delivered, accessed, and managed can increase learning efficiency and provide innovation in teaching methods (Hermawan, 2024:41). By using the right keywords, one can find various learning resources such as scientific articles, journals, e-books, learning videos, and many more. Digital literacy in sourcing learning resources also involves the ability to evaluate the reliability and accuracy of information found online. In the face of such an abundance of information, it is important for individuals to be able to distinguish between reliable and less reliable sources. This involves the ability to check the credibility of the author, assess the reputation of the website, and consider whether the information is consistent with other reliable sources. Digital literacy also includes the ability to use online learning platforms such as online courses, webinars, and discussion forums. With these platforms, individuals can access structured learning resources and interact with instructors and fellow learners. The ability to participate in online discussions, follow a flexible learning schedule, and complete assignments independently are all part of the digital literacy required to effectively source for learning resources. Digital skills also include skills in using social media as a learning resource. With platforms such as Twitter , Facebook , and LinkedIn , individuals can follow accounts that provide relevant educational information and content. The ability to sort out useful information from less relevant information, participate in online discussions, and build networks with experts and fellow learners are part of the digital skills that are important in finding learning resources through social media. By mastering digital media skills, vocational participants will be able to compete globally.

3.5. Effective Blended Learning in Vocational Learning

The application of Blended Learning is using the W2CPATHIK approach. The W2CPATHIK vocational learning approach according to Sudira (2024:148) is an approach that integrates: (1) work knowledge, (2) content knowledge, (3) cybergogy knowledge (4) peergogy knowledge, (5) andragogy knowledge, (6) technology knowledge, (7) heutagogy knowledge, (8) indigenous knowledge. The heutagogy approach can be practiced through blended learning (Sudira, 2017: 168). The application of the heutagogy approach in the context of SMK (Vocational High School) learning can provide

significant benefits for students. In the context of SMK, the heutagogy approach can help students develop independent skills, initiative, and responsibility in the learning process.

This is in accordance with the objectives of SMK education which emphasizes the mastery of practical skills and work skills. Curriculum development and training learning in preparing individuals as tough workers in mastering work skills and semi-skills, or becoming technicians and professionals (Sudira, 2012:09). This adjustment is important so that students get a holistic learning experience, where they not only master knowledge, but are also able to apply skills in real situations. By adopting appropriate blended learning, vocational education can be more flexible, responsive to technological developments, and remain relevant in facing the challenges of the ever-evolving world of work

IV. CONCLUSIONS

Developing digital skills in vocational learning is very important considering the increasingly dynamic changes in industrial needs. Today's industry demands workers who not only have technical skills, but are also able to adapt to technological developments. Therefore, vocational learning models must be adapted into blended learning which combines conventional learning with digital technology. This approach will help students develop relevant core skills and be ready to face the challenges of the ever-evolving world of work

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