Developing a Conceptual Framework of Digital Literacy as a Strengthening Mechanism for Generation Z's Work Readiness through Skill Competency in Jakarta Vocational High Schools

Melvida Dwi Agustya

Master of Management Study Program, Sarjanawiyata Tamansiswa University, Yogyakarta, Indonesia
sman5.melvidagst@gmail.com

Abstract. The rapid advancement of digital technology in the Industry 4.0 era has significantly changed workforce requirements. Companies today no longer seek graduates who only master technical skills. They also expect vocational high school graduates to have strong communication skills, problem-solving abilities, teamwork, and adaptability. However, many SMK graduates in Indonesia still struggle to enter the workforce. This shows a gap between what is taught in schools and what is needed by industries. This study aims to develop a conceptual framework to explain how digital literacy can strengthen the influence of skill competency on the work readiness of Generation Z students in vocational high schools in Jakarta. A Systematic Literature Review approach based on PRISMA guidelines was used by analyzing 24 articles published from 2021 to 2026. This study is grounded in Human Capital Theory, Employability Theory, and Career Construction Theory. The conceptual analysis found that skill competency has a positive effect on students' work readiness. In addition, digital literacy acts as a moderating variable that strengthens this relationship. Students with high skill competency and digital literacy are better able to apply their abilities in digital work environments. Therefore, vocational schools and policymakers are encouraged to integrate digital literacy into the curriculum to better prepare SMK graduates for the demands of the digital workplace.

Keywords: Digital Literacy, Generation Z, Skill Competency, Vocational high school (SMK), Work Readiness.

1 Introduction

Currently, the development of digital technology is progressing very rapidly, especially with the emergence of the Industry 4.0 era. This directly contributes to changing the skill demands in the workplace. Today, companies no longer require graduates who are solely proficient in technical aspects. They also expect graduates who possess good communication skills, strong problem-solving abilities, quick adaptability, and the capacity to work effectively in teams. Therefore, Vocational High Schools (SMK) are required to produce graduates who are job-ready and aligned with industry needs. However, in reality,

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many SMK graduates still encounter difficulties when entering the workforce. This indicates a gap between what is taught in school and what is actually required by companies [1].

Several previous studies have shown that vocational competence plays an important role in improving students' work readiness. This competence provides students with technical knowledge, practical skills, and professional attitudes needed to enter and face the demands of the workplace. Nevertheless, the extent to which vocational competence influences work readiness still requires further investigation, particularly among Generation Z vocational high school students in developing countries. Vocational competence is not the single determinant of work preparedness, but it is also affected by a variety of other elements such as job motivation, internship experience, and the capacity to use digital technologies. This demonstrates that the link between vocational competence and work preparedness needs to be thought about more seriously. Therefore, further research is needed to explore the extent to which vocational competence contributes to improving the work readiness of Generation Z, particularly in responding to the continuously evolving demands of the workplace [2].

Being ready for work is not just the quantity of knowledge a person has. More crucial is the capacity to apply knowledge in practice, to solve issues and to adapt to technological developments. In this respect, vocational competency is very significant since it provides students with the technical knowledge and practical abilities. However, another factor may strengthen the influence of this competence, namely digital literacy. Digital literacy does not directly determine work readiness; rather, it helps students utilize their competencies more effectively. This can be seen in their ability to access information, communicate digitally, and adapt to technological developments. Therefore, students with the same level of vocational competence may demonstrate different levels of work readiness depending on their level of digital literacy [3].

Vocational competence includes *hard skills*, such as technical abilities, and *soft skills*, such as communication, teamwork, and adaptability. Both aspects are important in preparing students to enter the workforce. At the same time, the development of technology has made digital literacy increasingly necessary. Digital literacy helps students use their competencies more effectively, for example, by accessing information, communicating digitally, and using technology to complete their work. Jakarta was chosen as the research context because digital technology is developing rapidly and the demand for workers with digital skills continues to increase. This situation makes vocational high school students in Jakarta a relevant context for examining the relationship between vocational competence, digital literacy, and work readiness. This study uses *Human Capital Theory*, *Employability Theory*, and *Career Construction Theory* as its theoretical foundation. These theories highlight the importance of knowledge, skills, and adaptability in developing work readiness. Therefore, digital literacy can help students make better use of their vocational competence and strengthen their readiness to face the changing demands of the workplace [4].

The correlation between the proficiency of skills and work preparedness has been widely studied in several prior research. However, the number of research that elaborately

address the importance of online literacy in enhancing this relationship is currently limited. This difference is very obvious when considering Generation Z Jakarta vocational high school students. In response to this gap, this study attempts to create the conceptual framework to explain the strengthening role of online literacy on the effect of skill competency on students' work preparedness. This study is expected to contribute to the advancement of knowledge in the areas of vocational education and human resource development by placing online literacy as a moderating variable. In addition, from a practical perspective, the findings of this study are expected to provide considerations for vocational schools and policymakers. The aim is to support the development of curricula that are better aligned with the needs of the workplace in today's digital era [5].

2 Literature Review

2.1 Human Capital Theory

According to Schultz's (1961) and Becker's (1964) Human Capital Theory, education, knowledge, skills, and competencies are types of capital that people own. Because they can bring value to people, especially by boosting productivity, competitiveness, and job prospects, these are seen as kinds of capital. People can acquire the skills required in the workplace through education and training, which benefits both the organizations they work for and themselves. According to this viewpoint, investing in education is crucial since it may enhance the caliber of human resources and boost each person's success in the job market [6].

In the context of vocational education, Human Capital Theory serves as the foundation explaining the importance of developing skill competencies to prepare graduates for entering the workforce. Vocational schools aim not only to provide theoretical knowledge, but also to shape technical and professional competencies that align with industry needs. With strong competencies, graduates are expected to demonstrate higher productivity and better job readiness [7].

However, the advancement of digital technology has transformed the demands of the labor market. Today, mastering skill competencies alone is insufficient if it is not accompanied by the ability to utilize digital technology. Therefore, this study draws on Human Capital Theory to explain that the value of skill competencies becomes optimal when supported by digital literacy. In this research, digital literacy is viewed as an ability that helps students utilize their skills more effectively, thereby strengthening the impact of skill competencies on the job readiness of Generation Z in the era of digital transformation [8].

2.2 Employability Theory

A clear viewpoint on this matter is offered by employability theory. Technical proficiency is not the only factor that determines success in the profession. Other elements are equally

significant, such as a person's capacity to find work, keep a job, and advance professionally. This idea states that a variety of qualities, such as knowledge, skills, attitudes, and adaptability, are all part of employability. These skills are necessary for people to adapt successfully to the ever-changing demands of the workplace. As a result, those who are highly employable are typically better prepared, especially when making the move from formal education to the real world of work [9].

In the context of vocational education, Employability Theory serves as the foundation explaining that the objective of education is not merely to produce graduates who master skill competencies, but also graduates who are job-ready. This job readiness encompasses the ability to apply competencies in real work situations, communicate effectively, collaborate in teams, solve problems, and adapt to technological advancements as well as shifting industry demands. Thus, job readiness is viewed as the outcome of combining technical competencies with various supporting skills required in the workplace [2].

Along with the progression of digital transformation, the concept of employability has also evolved. Today's job market increasingly requires a workforce that possesses not only skill competencies, but also the ability to leverage digital technology to perform work tasks. Therefore, this study refers to Employability Theory to explain that job readiness is influenced not only by skill competencies, but also by students' ability to utilize digital technology. In this research, digital literacy is viewed as an ability that helps students optimize their existing skills, making them better prepared to meet the demands of the workplace in the digital era [5].

2.3 Career Construction Theory

Career Construction Theory, introduced by Savickas in 2005, views career development as an ongoing process that evolves throughout a person's life rather than something established at a single point in time. This process is significantly shaped by an individual's capacity to respond to changes in the work environment. Accordingly, career success depends not only on a person's existing skills and competencies but also on career adaptability, the ability to manage change, embrace continuous learning and new experiences, and respond effectively to changing workplace expectations. This capacity is increasingly important as the nature, demands, and practices of work continue to evolve. Individuals who adapt successfully are therefore more likely to maintain, advance, and develop their careers in line with the changing requirements of the workplace [10].

In the context of vocational education, Career Construction Theory provides a foundation indicating that students must be prepared not only with skill competencies, but also with the ability to continuously learn and adapt to changing industry demands. Vocational high school (*SMK*) graduates are expected to adjust to technological developments, changing work processes, and new competency demands arising from digital transformation. Therefore, job readiness is viewed not as a static capability, but as one that

continuously evolves along with learning experiences and changes in the work environment [4].

The rapid advancement of digital technology accelerates changes in the workforce, making adaptability increasingly vital. In this study, Career Construction Theory is used to explain that digital literacy helps students enhance their adaptability to an increasingly digitalized work environment. Students with high digital literacy find it easier to leverage technology, stay informed, and apply their skill competencies across diverse work scenarios. Therefore, digital literacy is viewed as a factor that strengthens the impact of skill competencies on the job readiness of Generation Z in the era of digital transformation [11].

Table 1. Summary of Theoretical Framework

Theory	Role in Research	Explained Variable
Human Capital Theory	Explains that skill competencies represent human capital that enhances individual productivity and value in the workforce.	**Skill Competencies**
Employability Theory	Explains that job readiness is influenced by a combination of knowledge, skills, attitudes, and the ability to obtain and retain employment.	**Work Readiness**
Career Construction Theory	Explains that individuals must continuously adapt to changes in the workforce, including digital technology developments..	**Work Readiness the Role of Digital Literacy**

2.4 Work Readiness

Because it shows how ready students are to enter the workforce, adjust to the workplace, and carry out their jobs efficiently, work readiness is a crucial term in human resource development and vocational education. In addition to technical proficiency, work preparedness include knowledge, practical skills, professional attitudes, teamwork and communication ability, critical thinking, and problem-solving capabilities. Additionally, mental preparedness is crucial since students must be ready to handle a variety of demands and difficulties that could occur in the job. Because it is influenced by a number of complementary factors, job preparedness can be viewed as a multifaceted skill [12].

Numerous studies have shown that students with a high level of work readiness tend to adapt more easily to the workplace, understand their assigned tasks and responsibilities more quickly, and demonstrate better job performance from the beginning of their careers. Conversely, low levels of work preparedness might result in difficulty in adapting to the organizational culture, handling stress at work and responding to changes in job expectations. However, studies still have not reached a consensus about the most relevant

predictors of work preparedness. Some research found that technical skills were the most important aspect, whereas other studies found employability skills, internship experience, flexibility, learning environment, and digital competence to be important. These mixed findings show that work preparedness is a complex outcome which is influenced by the interplay of multiple competences, not just one single factor [2].

Consistent with Employability Theory and Career Construction Theory, as discussed in the theoretical framework, work readiness is viewed as a dynamic and continuously evolving capability. It is not determined solely by the mastery of technical competencies but also by an individual's ability to adapt to changing workplace environments, acquire new skills, and engage in lifelong learning through education, training, and work experience. Therefore, work readiness should be continuously developed to enable students to meet the increasingly complex and digitalized demands of the modern workplace [13].

Following the previous debate, this study proposes that online literacy acts as a moderating variable that enhances the link between technical competence and work preparedness. In the time of digital transformation, the online literacy level of students is positively associated with their utilization of technical competencies to meet the needs of workforce. On the other hand, in workplaces that are progressively reliant on digital technology, a deficiency in comprehending these technologies may hinder the complete cultivation of the technical skills necessary for effective job performance. Thus, technological literacy is advocated as a strengthening element that will strengthen the favorable effect of technical competence on work readiness, especially for Generation Z vocational high school (SMK) students who are ready to enter the digital workforce [8].

2.5 Skill Competency

Skill competency is one of the important forms of capital that students need as preparation for entering the workforce. From the perspective of *Human Capital Theory*, the knowledge, skills, and abilities possessed by an individual can be viewed as human capital that serves as an asset for improving productivity and competitiveness, while also increasing the chances of obtaining and retaining employment. Therefore, vocational education should not only focus on providing technical knowledge and skills but also on developing competencies that are truly relevant to industry needs. This is becoming increasingly important as industry needs and job demands continue to change along with developments in the workplace [14].

Skill competencies extend beyond mastering knowledge and technical skills in a specific field; they encompass the ability to apply that knowledge in real-world work scenarios, demonstrate professional attitudes, solve problems, and leverage practical experience to execute tasks effectively. With well-developed competencies, students are expected to perform their duties and responsibilities optimally while delivering positive contributions to their organizations [15].

Various previous studies show that skill competency has a positive influence on work readiness. Students with good competency are generally more confident, adapt more easily to the work environment, and are able to demonstrate better performance when

entering the workforce. However, recent studies also show that skill competency alone does not always guarantee a person's success in entering the job market. Individuals with the same level of technical competency may exhibit different levels of work readiness due to the influence of other factors, such as practical work experience, learning environment, self-development opportunities, and the ability to utilize digital technology [2].

The development of digital technology, automation, and industrial transformation has also shifted the meaning of skill competency. While competency previously emphasized the mastery of technical abilities (hard skills), the workforce today expects graduates to possess more integrated competencies. Beyond mastering technical skills, graduates are also required to have soft skills, such as communication, teamwork, critical thinking, adaptability to change, creativity, and a willingness to engage in lifelong learning. Consequently, skill competency is no longer viewed as a static capability, but rather as one that must be continuously developed to remain relevant to technological changes and the demands of the labor market [16].

Based on the above description, this study concludes that skill competency is an integrated capability encompassing knowledge, technical skills (hard skills), non-technical skills (soft skills), and professional attitudes required to support student work readiness. However, the effectiveness of this competency is determined not only by its mastery, but also by the students' ability to utilize their competencies in accordance with the demands of an increasingly digitalized work environment. Therefore, supporting factors capable of optimizing the application of skill competencies are required, one of which is digital literacy as an ability that helps students apply their competencies more effectively in the era of digital transformation.

2.6 Digital Literacy

Digital literacy is a person's ability to use digital technology to find, understand, evaluate, manage, create, and communicate information effectively. It is not only about being able to use a laptop or mobile phone, but also about how a person uses technology and information critically, ethically, and responsibly. As technology continues to develop, digital literacy has become increasingly important because digital technology is now part of many activities, including learning and work. In the workplace, digital technology is commonly used in daily activities, such as using information systems, communicating online, working with others as a team, and processing data. Therefore, graduates need to have digital literacy so they can use technology properly and adapt to a workplace where digital technology is increasingly used [17].

Previous studies have consistently reported that digital literacy has a positive influence on work readiness. Students with strong digital literacy are generally better able to adapt to technological advancements, utilize a wide range of digital applications effectively, and respond more successfully to changes in the workplace. However, most of these studies have treated digital literacy as a direct determinant of work readiness. This perspective does not fully explain why individuals with similar levels of technical competence may demonstrate different levels of work readiness [5].

From a theoretical perspective, digital literacy does not directly develop an individual's technical competence. Instead, it enables individuals to apply their existing competencies more effectively by enhancing their ability to access information, utilize digital technologies, communicate, collaborate, and solve problems in digitally enabled work environments. Consequently, students with similar levels of technical competence may exhibit different levels of work readiness because of differences in their levels of digital literacy [18].

Based on the preceding discussion, this study positions digital literacy as a moderating variable that strengthens the relationship between technical competence and work readiness. The higher the level of digital literacy possessed by students, the more effectively they are able to utilize their technical competencies to meet the demands of the workforce in the era of digital transformation. Conversely, when digital literacy is limited, technical competence alone may not be fully translated into effective workplace performance in environments that increasingly rely on digital technologies. Therefore, digital literacy is proposed as a reinforcing factor that enhances the positive effect of technical competence on work readiness, particularly among Generation Z vocational high school (SMK) students preparing to enter the digital workforce [8].

3 Conceptual Development and Research Propositions

Previous literature shows that work readiness can be influenced by various factors, both from within the individual and from the surrounding environment. Several studies also show that skill competency is an important factor in developing work readiness. However, competency alone is not always enough. This can be seen in graduates who have relatively similar levels of technical competency but show different levels of readiness when entering the workplace. This condition suggests that other abilities are needed to help students make better use of their competencies. This becomes even more important as the current workplace increasingly relies on digital technology [19].

Based on the three theories discussed, skill competency can be seen as an important foundation for developing students' work readiness. However, workplaces today increasingly rely on digital technology, so having good competency alone may not always be enough. The effectiveness of these competencies also depends on how well individuals can use digital technology to support their work. In this case, digital literacy can help strengthen the use of skill competency. When students have good skill competency and are also supported by digital literacy, they are better able to apply their abilities and deal with the demands of the workplace, which can ultimately improve their work readiness [11].

Unlike previous conceptual studies, which have primarily positioned digital literacy as an independent predictor of work readiness, this study argues that digital literacy plays a more strategic role as a moderating capability. Digital literacy does not directly create work readiness; rather, it enhances the effectiveness of technical competence by enabling graduates to apply their technical knowledge and skills more efficiently in technology-intensive organizational environments. Consequently, graduates with similar levels of

technical competence may exhibit different levels of work readiness depending on their level of digital literacy [20].

Based on the synthesis of the theoretical perspectives and previous research findings, this study proposes a conceptual framework that explains the relationships among technical competence, digital literacy, and the work readiness of Generation Z students in vocational high schools (SMKs). Within this framework, technical competence is proposed to have a direct positive effect on work readiness, while digital literacy functions as a moderating variable that strengthens this relationship. Accordingly, the proposed conceptual framework not only explains the direct relationship between technical competence and work readiness but also suggests that the strength of this relationship depends on the level of digital literacy possessed by students [21].

Based on the proposed conceptual framework, this study formulates the following research propositions:

P1: Technical competence has a positive effect on the work readiness of Generation Z students in vocational high schools (SMKs).

P2: Digital literacy positively moderates the relationship between technical competence and the work readiness of Generation Z students in vocational high schools (SMKs), such that higher levels of digital literacy strengthen the positive effect of technical competence on work readiness.

4 Methodology

This study uses two approaches: a *Systematic Literature Review* (SLR) and conceptual analysis. These approaches are used to examine how digital literacy may moderate the relationship between skill competency and work readiness, particularly among Generation Z students in vocational high schools (SMK) in Jakarta. To keep the research process transparent and systematic, the stages of searching, screening, and selecting articles follow the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) guidelines [22]. Following these guidelines helps make the literature selection process more organized, clear, and easier for other researchers to understand and replicate.

The literature search was conducted using two main databases, namely Google Scholar and ScienceDirect. The researchers limited the studies included in the review to articles published within the last five years, covering the period from 2021 to 2026. To identify relevant studies, a combination of keywords was used with Boolean operators. The keywords included Skill Competency, Digital Literacy, Work Readiness, Generation Z, and Vocational High Schools (SMK) in Jakarta.

Following all stages of the PRISMA-guided selection process, a total of 24 articles met all the inclusion criteria and were selected as the primary sources for the qualitative synthesis, thematic coding, and the development of the study's conceptual framework. Of these, 18 articles were retrieved from Google Scholar and 6 articles from ScienceDirect. This number was considered adequate because all selected studies were peer-reviewed publications, directly addressed the topics of technical competence, digital literacy, and

work readiness, and aligned with the objectives of the present study. Consequently, the synthesized evidence provides a robust theoretical foundation for explaining the relationships among the variables included in the proposed conceptual model.

Although only 24 articles satisfied the inclusion criteria, this number is considered sufficient for a Systematic Literature Review (SLR) focusing on a specific research topic and context. This study prioritized the quality and relevance of the selected literature over the quantity of articles reviewed. Accordingly, only publications that fulfilled all inclusion criteria and met the established methodological standards were incorporated into the synthesis process.

5 Results and Discussion

P1 : The results of the conceptual analysis indicate that technical competence has a positive effect on the work readiness of Generation Z students in vocational high schools (SMKs). This finding reinforces the view that technical competence represents a fundamental form of human capital that students must possess to successfully enter the workforce. Technical competence encompasses not only the mastery of technical knowledge and practical skills but also professional attitudes and the ability to apply these competencies effectively in real workplace situations. Students with higher levels of technical competence tend to demonstrate greater self-confidence in completing work-related tasks, perform according to industry standards, and adapt more readily to workplace demands. Therefore, strengthening technical competence through practice-based learning, project-based learning, and work-based learning experiences is essential for enhancing the work readiness of vocational high school graduates [3].

This discussion is consistent with previous studies that have identified technical competence as a primary determinant of work readiness. However, the increasing digitalization of the workplace suggests that technical competence alone is no longer sufficient to produce graduates who are fully prepared to meet the evolving demands of industry. Digital transformation has fundamentally changed the way people work, communicate, and solve workplace problems. Consequently, vocational high school (SMK) graduates are expected not only to possess technical competencies relevant to their field of expertise but also to demonstrate the ability to utilize digital technologies effectively in professional settings [23].

P2: Furthermore, the results of the conceptual analysis indicate that digital literacy positively moderates the relationship between technical competence and work readiness. This means that the higher the level of digital literacy possessed by students, the stronger the positive effect of technical competence on work readiness. Digital literacy enables students to access information, utilize digital technologies, operate productivity applications, communicate professionally through digital platforms, and critically evaluate information. These capabilities allow students to apply their technical competencies more effectively in increasingly technology-driven work environments [18].

The moderating role of digital literacy can be explained by the characteristics of Generation Z, who have grown up in an environment shaped by rapid technological advancement. Although Generation Z is often regarded as a generation of digital natives, the ability to use technology effectively for academic and professional purposes does not develop automatically. Digital literacy requires the integration of technical, cognitive, ethical, and social competencies to ensure that digital technologies are used productively and responsibly. Therefore, students with high levels of technical competence but limited digital literacy may still encounter difficulties when working with digital workplace systems, industry-specific software, or technology-enabled collaboration. In contrast, students with higher levels of digital literacy are better able to integrate their technical competencies with digital technologies, thereby achieving higher levels of work readiness [24].

These conceptual findings suggest that enhancing the work readiness of vocational high school (SMK) graduates requires more than simply improving their technical competence. Schools must also equip students with strong digital literacy through technology-integrated learning, project-based learning, the use of industry-relevant digital applications and software, and the development of critical thinking skills for evaluating and utilizing digital information. By adopting this approach, SMK graduates will not only possess the technical competencies required by industry but also be better prepared to adapt to technological advancements and the continuously evolving demands of the modern workplace [1].

Based on the discussion above, this article proposes two main propositions that complement each other. The first proposition is that skill competency is a key factor influencing students' work readiness. The second proposition highlights the role of digital literacy in strengthening this relationship. In other words, students with strong skill competencies and a high level of digital literacy are expected to demonstrate greater readiness to enter the workforce. These propositions suggest that developing skill competencies alone may not be sufficient. It needs to be accompanied by efforts to strengthen digital literacy so that vocational high school graduates are better prepared to meet the changing demands of the workplace. Therefore, the conceptual model proposed in this article may serve as a useful reference for future research, particularly for empirically examining the relationships among skill competency, digital literacy, and work readiness among vocational high school students in Indonesia.

6 Conclusion

This conceptual study concludes that skill competency is a key factor in determining the work readiness of Generation Z students in vocational high schools. Students who possess both technical and non-technical skills tend to be more confident and better prepared to meet industry demands. However, in today's digital workplace, technical competence alone is not enough.

The findings also indicate that digital literacy plays an important role as a moderating variable. Digital literacy helps students use their competencies more effectively in technology-based work systems. As a result, the positive impact of skill competency on work readiness becomes stronger when supported by adequate digital literacy.

Based on these findings, this study proposes two main implications. First, vocational schools need to design learning that not only focuses on technical skills but also integrates digital tools, project-based learning, and critical thinking. Second, policymakers should encourage curriculum updates that align with the needs of the digital industry.

Overall, this conceptual framework provides a foundation for future empirical research. Future studies are encouraged to test this model quantitatively to obtain more concrete evidence on the relationship between skill.

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