



## Factors that Affect the Quality of Vocational Education Graduates in the 4.0 Era: Job Readiness, Skills and Digital Services

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**Abstract:** Vocational education is an education that provides technical skills, knowledge and abilities needed by the workforce in various industrial sectors, but currently there are many graduates who are not accepted to work in the industrial sector, including because the graduates do not have the quality that adequate according to industry standards. The purpose of this study is to find out several factors that affect the quality of graduates. This research method is a literature review taken from several digital search sources of scientific journals such as the Garuda website, Researchgate and Google Scholar. The results obtained are that the factors that affect the quality of graduates are: (1) job readiness, (2) skills, and (3) digital service capabilities. Meanwhile, several other factors that need to be made for further studies are factors (1) disciplinary attitude, (2) independence, and (3) academic achievement.

**Keyword:** Quality, Job Readiness, Skills and Digital Service

### INTRODUCTION

Vocational education is becoming increasingly important in an effort to prepare a competent workforce in various industrial sectors (Mahmudah & Santosa, 2021). However, there is still debate about the quality of vocational education graduates. In this paper, a literature review of the quality of vocational education graduates will be carried out.

Vocational education is an education that provides technical skills, knowledge and abilities needed by the workforce in various industrial sectors (Bellés-Obrero & Duchini, 2021a). Vocational education is usually carried out through training or formal education, and focuses on developing practical skills and solving problems related to a particular job (Deutscher & Winther, 2018). However, currently there are many graduates who are not

accepted to work in the industrial sector, including because the graduates do not have adequate quality according to industry standards (Cavanagh et al., 2015a).

The quality of vocational education graduates can be measured in various ways. One commonly used way is to see the level of suitability between the skills mastered by graduates and the needs of the industry. Several studies have shown that the quality of vocational education graduates can be improved by integrating vocational education with industry (Shamzzuzoha et al., 2022).

One of the factors that affect the quality of vocational education graduates is the curriculum and teaching methods used (Liu et al., 2021). Several studies have shown that curriculum relevant to industry needs and teaching that focuses on practical learning and real experience can improve the quality of vocational education graduates (Muhammad et al., 2022). In addition, another factor that can affect the quality of vocational education graduates is the quality of teachers (Zhou et al., 2022a). Qualified and experienced teachers can help improve the quality of vocational education and the quality of graduates.

Several efforts have been made to improve the quality of vocational education graduates. One of these efforts is to improve the quality of teachers and provide training to teachers so that they can teach more effectively. In addition, the integration between vocational education and industry can also help improve the quality of graduates. By involving industry in the vocational education process, graduates will be better prepared to face challenges in the world of work (Min & Tsang, 1990).

Improving the quality of curriculum and teaching methods can also help improve the quality of vocational education graduates. A well-designed curriculum and effective teaching methods can help prepare graduates with skills and knowledge relevant to industry needs. The quality of vocational education graduates is becoming increasingly important in today's world of work (Zhou et al., 2022b). To improve the quality of graduates, efforts need to be made to improve the quality of teachers, namely by integrating vocational education with industry.

Human resources in the 4.0 era emphasize readiness, skills, investment (human capital investment), and digital service (Mahmudah & Putra, 2021). The most important thing about human resource development is that there is adequate and sufficient investment to be able to make human resources superior and uphold unlimited professionalism in working, as well as in facing and operating equipment according to the needs of the world of work.

To make it easier for researchers to find articles as scientific references, an empirical study of the relevant previous research literature is needed. The results of the article study are needed to strengthen the theoretical foundation used in the research, as well as to see the relationship or influence between variables and build hypotheses. This article discusses the effect of job readiness, skills, and digital services on the quality of vocational education graduates, a literature review study in the field of vocational education. Based on the background, the problems that will be discussed can be formulated to build hypotheses for further research, namely:

1. Does job readiness affect the quality of vocational education graduates?
2. Do skills affect the quality of vocational education graduates?
3. Do digital services affect the quality of vocational education graduates?

## **LITERATURE REVIEW**

### **Quality of Vocational Education Graduates**

The quality of vocational education graduates is an indicator of the extent to which graduates have skills and knowledge (Bellés-Obrero & Duchini, 2021b), that are relevant and in accordance with industry needs and are able to adapt to a changing work environment. The

quality of graduates can also be seen from the ability of graduates to solve problems and apply practical skills obtained during vocational education (Kwarteng & Mensah, 2022).

Graduate quality theory is a concept related to the ability of graduates to meet the requirements of the desired industry or job market. This theory involves understanding the standards and criteria required by the industry or job market that will employ graduates. Some important aspects related to graduate quality theory are as follows, namely: (1) skills and knowledge (Gilbert et al., 2022), (2) attitudes and behaviors (Kong & Yuen, 2022), (3) adaptability (de Guzman & Choi, 2013), and (4) job readiness (Herbert et al., 2020).

The quality of graduates can be seen from their ability to apply the skills and knowledge that have been learned during education. In addition, graduates must also have adequate knowledge in fields relevant to the industry or job market to be pursued. The quality of graduates is also related to the attitudes and behaviors shown by graduates during work. Positive attitudes such as hard work, discipline, responsibility, and integrity are essential in ensuring good quality graduates (Zhang et al., 2023).

Graduates who have the ability to adapt quickly to changes in the industry or job market will be considered to have good quality (Chigbu & Nekhwevha, 2022). These adaptabilities include the ability to learn, solve problems, and face emerging challenges. Graduates who are ready to work and meet the requirements of the industry or job market are also considered to be of good quality. This job readiness includes the ability to operate equipment and technologies used in the desired industry or job market, as well as the ability to work in teams.

Graduate quality theory also involves an understanding of the standards and criteria required by the industry or job market. These standards can be technical abilities, interpersonal skills, or other characteristics that are considered essential for success in the desired industry or job market (Islam, 2022). In the context of vocational education, the theory of graduate quality is also related to the ability of graduates to apply practical skills and adapt to a changing work environment. A good vocational education will prepare its graduates with practical skills and knowledge that are in accordance with the needs of the desired industry or job market.

### **Work Readiness**

The willingness to work factors consist of personal characteristics include skills, abilities, knowledge, self-direction, adaptability and flexibility (Vrchota et al., 2020). Other factors are organizational skills, including ethics or professionalism in the workplace, social responsibility, global knowledge and self-determination or lifelong learning. The third factor is job skills, which include critical thinking, organizational skills, creativity or innovation, and problem-solving skills. The fourth factor is social intelligence, such as B. ability to collaborate or work in a team, adaptability, interpersonal or social skills and communication skills.

Job readiness theory is a concept related to the ability of graduates to meet the desired job requirements (Cavanagh et al., 2015b). This theory involves an understanding of the standards and criteria required by the industry or job market that will employ graduates. Some important aspects related to the theory of work readiness, namely: (1) technical ability (Chalutz & Cohen, 2022), (2) interpersonal skills (Dammert & Nansamba, 2023), (3) mental and emotional readiness (Hou et al., 2021), and (4) readiness to learn (Okolie, 2022).

Work readiness includes the technical skills needed in the job (Barbosa et al., 2022). Graduates are expected to have knowledge and skills relevant to the position to be filled, as well as the ability to operate the equipment and technology used in the job. Job readiness also involves the ability of graduates to communicate and cooperate with others. Interpersonal skills such as the ability to communicate well, work in a team, and build good relationships

with customers or clients are critical in ensuring success at work. Work readiness also involves mental and emotional readiness to face challenges and pressures in the workplace. Graduates are expected to have the ability to manage stress, adapt to rapid changes, and make informed decisions under pressure. Work readiness involves the ability to continue learning and evolving in the workplace. Graduates are expected to have the willingness to continue to learn and improve their skills and knowledge, as well as the ability to take the initiative in developing themselves.

Job readiness theory also involves an understanding of the standards and criteria required by the industry or job market. These standards can be technical abilities, interpersonal skills, or other characteristics that are considered essential for success in the desired workplace. In the context of vocational education, job readiness theory is also related to the ability of graduates to apply practical skills acquired during vocational education. A good vocational education will prepare its graduates with practical skills and knowledge that are in accordance with the needs of the desired industry or job market, as well as the ability to learn and develop in the workplace.

Readiness is the level of maturity or self-development of maturity that is conducive to practicing. The work readiness of SMK students is very important because SMK graduates are ready to use the workforce for use in professional life. How prepared students are to work depends on how students prepare for their professional life. Job readiness can be defined as the ability to find and adapt to the work needed and desired without help. Preparing for professional life requires careful readiness in a person, especially in relation to qualities related to oneself. Readiness is the point of maturity to be able to accept and pay attention to certain behaviors (Creed et al., 2007). The level of readiness for something is influenced by three factors, namely (1) the level of maturity which is a developmental process that in this case the physical and mental has achieved perfect development in the sense of being ready for use. This level of maturity is usually influenced by age and physical factors. (2) past experiences, i.e. certain experiences gained relating to the environment, available opportunities and intentional outside influences (education and teaching), as well as unintentional influences. (3) a harmonious mental and emotional state that includes a critical attitude, has logical, objective, mature considerations and the emotions can be controlled. A student who has high job readiness if he has abilities that include aspects of attitudes, knowledge, and skills according to their field. This makes students a ready-made force in the face of the world of work.(Chaplin, 2006)(Farihati et al., 2019)(Ward & Riddle, n.d.)(Farihati et al., 2019)

## **Skills**

Skill theory is a concept that explains how a person can acquire certain skills or abilities through the process of learning and experience. The theory also describes the way in which such skills can be tested and evaluated. There are several theories related to skills, among which are: (1) cognitive learning theory, (2) social skills theory, (3) contextual learning theory, (4) critical thinking skills theory.

Cognitive learning theory considers that the learning of skills involves cognitive processes such as pattern recognition, analysis and synthesis. According to this theory, the learning of skills requires experience, problem solving and reflection. Social skills theory focuses on developing interpersonal skills, such as communication, leading, and working in teams. This theory considers that social skills can be taught and practiced, and that the ability to interact with others can be improved through experience and practice. The theory of contextual learning theory considers that skill learning occurs in a broader social, economic, and cultural context (Muhammad et al., 2022). According to this theory, skills learning involves hands-on experience in real-world situations, which allows individuals to develop an

understanding of how skills can be applied in different contexts. This theory considers that critical thinking skills can be taught and improved through systematic practice and experience. According to the theory of critical thinking skills, individuals who have critical thinking skills can understand, analyze, and evaluate information critically, as well as make wise and appropriate decisions.

Skill theory is also important in vocational education, since vocational education usually emphasizes on the development of practical skills necessary in a particular job. In vocational education, skills theory can be used to design effective curricula and teaching methods, as well as to evaluate skills acquired by students during the learning process.

### **Digital Services**

Students' abilities in digital services include the ability to use digital technology, understand how applications work, understand the principles of digital security, and be able to overcome technical problems that may occur (Muhammad et al., 2022). This ability can help students prepare to work in the growing digital age. Some of the key skills needed in digital services include: (1) digital literacy, (2) digital security, (3) problem solving, (4) creativity, (5) the ability to learn independently.

Digital literacy is the ability to use digital technology and understand how it can be used to find information, communicate, and solve certain tasks (Ali et al., 2023). Digital security is the ability to understand the principles of digital security and be able to protect personal data from cyberattacks. Problem solving is the ability to solve technical problems that may occur when using digital applications or services. Creativity is the ability to develop new ideas and solutions in the use of digital applications or services. The ability to learn independently is the ability to learn independently and continue to develop skills in digital services.

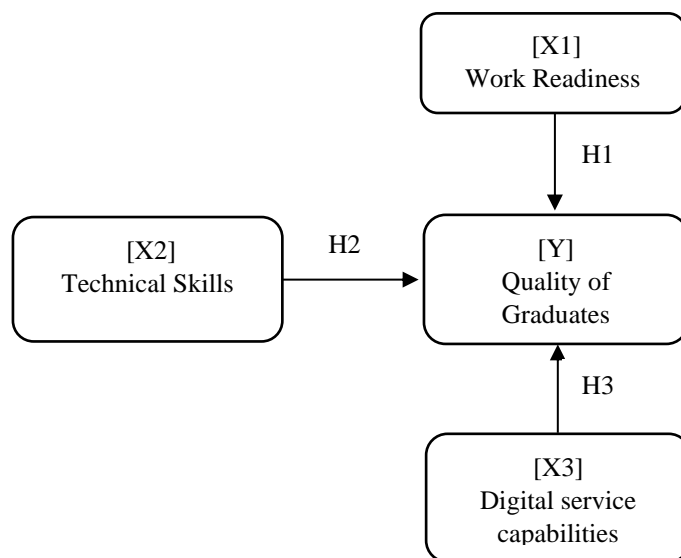
These abilities can be taught through training or courses focused on developing digital skills. Vocational education can also play an important role in developing students' abilities in digital services by providing training that is in accordance with the demands of the job market in the digital era. The importance of the maturity level of digital technology for workers to have in the era of the industrial revolution 4.0 (Bretz et al., 2022). The high maturity of digital technology competencies certainly also requires a comprehensive understanding which is the foundation for the formation of these competencies. This is the role of digital literacy in providing a comprehensive understanding of digital technology. The understanding includes functions, benefits, how to use them and develop them.

Vocational education students who are required to master technology in work, of course, are required to have digital literacy (Et al., 2021). The dominance of digital technology in the world of work in the era of the industrial revolution 4.0 will be responded quickly if digital literacy is strengthened from an early age, especially when studying (Spante et al., 2018). Without strong digital literacy, the ability to use digital technology will not be well formed in a person (Falloon, 2020; Pavlova, 2009). Digital technology literacy is the foundation for a person to build a comprehensive understanding of digital technology related to benefits, uses and deep functions to support future work (Trilling & Fadel, 2012). When digital competencies are defined with respect to the professional development of teachers, the concept is considered with respect to the ability of each teacher to implement ICT into learning activities to improve the development of students' knowledge and understanding (Krumsvik, 2014).

### **Conceptual Framework**

Based on the background of the problem that occurs, then referring to the formulation of the problem, the study of several relevant theories, and the discussion of the results of

previous research studies, a conceptual framework can be made as shown in figure 1. A conceptual framework is created to corroborate the picture of the relationship between variables as well as how the hypothesis is taken. Job readiness is a free variable (X1) that has a relationship to its bound variable, namely the quality of graduates (Y). So that a hypothesis (H1) can be made that job readiness affects the quality of graduates. Similarly, the variable of technical skills has a relationship to the variable quality of graduates. So that a second hypothesis (H2) can be made, namely technical skills affect the quality of graduates. The latter is that the conceptual framework shows the existence of a relationship between the variables of digital service capability (X3) and the quality of graduates (Y). The hypothesis (H3) that can be made is that the ability of digital services affects the quality of graduates



**Figure 1. Conceptual Outline**

Based on figure 1 which shows the *conceptual framework*, it is found that job readiness, skills, and digital services affect the quality of graduates, especially in the field of vocational education. The relationship of the three free variables to one bound variable was obtained based on the results of studies from several literatures as shown in table 1, namely the relevant previous research. However, apart from these three exogenous variables that affect the quality of vocational education graduates, there are many other variables that affect it including: (1) Disciplinary attitude: (Farihati et al., 2019), (2) Independence: (Farihati et al., 2019), and (3) Academic Achievement: (Indroasyoko et al., 2021).

**RESEARCH**

Qualitative methods and library research are used as methods of writing scientific articles. Examine several theories from previous research and the relationship or influence between variables derived from books and journals online through, Google Scholar and Garuda, ResearchGate and other scientific journal literature sources. From some of the literature that has been collected for the next one, a matrix-shaped resume is made that contains, namely: (1) the author's name and year, (2) the results of the study, (3) similarities with this article, and (4) differences with this article. In the discussion section, it will be explained how a variable affects other variables based on the literature that has been collected. Meanwhile, in the suggestion and recommendation section, some of the findings in the previous article review will be explained that are different from this article, to be redeveloped in the next writing.

**Table 1. Relevant past research**

No	Author (tahun)	Previous Research Results	Similarities with this article	Differences with this article
1	Masoud Rashid (2020)	Finding that job readiness affects the quality of graduates	There is an influence between job readiness and the quality of graduates	-
2	Insiyah Farihati (2019)	Finding that Job readiness depends on the level of maturity of experience as well as mental state and emotions that include willingness to cooperate with others, being critical, willingness accept responsibility, ambition to move forward as well as the ability to adjust to the work environment.	There is an influence between work readiness and the quality of graduates in adjusting to the work environment	This research also found that in addition to work readiness there are two other factors that affect the quality of graduates, namely: (1) The disciplinary attitude that students have will make students accustomed to following, obeying the rules and habits will gradually accustom himself to building a good personality, and (2) Learning independence will form a good student person and be able to compete in entering the world of work. Therefore, it is suspected that there is a positive influence between discipline and independence together on students' work readiness
3	Dhila Izza Angraini (2021)	Finding that communication skills have a significant role to play in graduates' employability. There are four aspects of skills that affect the quality of graduates, including: writing skills, speaking skills, non-verbal communication skills and listening skills.	Researching the influence of skills on the quality of graduates	Not researching the effect of job readiness, and students' digital service capabilities on the quality of graduates
4	Narwikant Indroasyoko (2021)	Social skills and academic achievement affect the absorption of graduates	Researching the influence of skills on the quality of graduates is seen from the many absorption in the world of work	Adding with the influence of academic achievement on graduate absorption, not researching the effect of job readiness, and students' digital service capabilities on the quality of graduates
5	Setuju (2021)	The need to improve digital literacy skills, because with digital literacy skills, will get students to have the ability to think critically, creatively, and innovatively (Setuju et al., 2021)	The "digital service" ability of students affects their skills so as to improve the quality of graduates	-
6	Rune Johan Krumsvik (2014)	This research found that digital competence is very important in determining the	Digital skills affect the policies of educational institutions in improving the quality of graduates	-

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policy of improving  
the quality of  
graduates in an  
educational  
institution.

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## RESULT AND DISCUSSION

Based on theoretical studies and previous research that are relevant and refer to the conceptual framework, the discussion of *this literature review* article in the concentration of vocational education is:

### 1. The effect of job readiness on the quality of vocational education graduates

Job readiness is a concept related to the ability of graduates to meet the desired work requirements. This theory includes an understanding of the standards and criteria required by the industry or labor market that employs graduates. Some important aspects related to employment theory, namely: (1) professional skills, (2) interpersonal skills, (3) mental and emotional readiness, and (4) willingness to learn.

The quality of graduates is a concept related to the ability of graduates to meet the needs of the industry or labor market. This theory includes an understanding of the standards and criteria required by the industry or labor market that employs graduates. Some important aspects related to the theory of learning quality are as follows: (1) skills and knowledge, (2) attitudes and behaviors, (3) adaptability, and (4) work readiness.

From the explanation above, it appears that indicators of job readiness (professional skills, interpersonal skills, mental and emotional readiness, and ability to learn) affect the indicators of vocational education graduates (skills and knowledge, attitudes and behaviors, adaptability, and work readiness). So to be able to improve the quality of graduates that must be done and get attention is to provide some skills such as professional technical skills, interpersonal skills, preparing for a stable mental and emotional state, and having adaptabilityz

Because there is an influence between work readiness and the quality of graduates from vocational education institutions, if all indicators of work readiness are met, vocational education graduates will have good quality to be able to work. Job readiness that affects the quality of graduates is in line with the research results of (Hinai et al., 2020) and (Farihati et al., 2019).

### 2. The influence of skills on the quality of vocational education graduates

Skills are concepts that explain how a person can acquire certain skills or abilities through the process of learning and experience. A person who has good skills means that they have quality learning outcomes. So that skills affect the quality of graduates, especially in vocational education which emphasizes working after graduation. The quality of graduates who have indicators, namely: 1) skills and knowledge, (2) attitudes and behaviors, (3) adaptability, and (4) job readiness.

To be able to improve the quality of graduates, what must be done is to meet several indicators of mastery of a certain technical skill. There are four aspects of skills that affect the quality of graduates, including: (1) writing skills, (2) speaking skills, (3) non-verbal communication skills and (4) listening skills. If some aspects of the skill indicators can be met, it will improve the quality of graduates. The skill factor that influences the improvement of the quality of graduates is in line with the research conducted by: (Izza Angraini & Sri Ardias, 2021), and (Indroasyoko et al., 2021).

### 3. The effect of digital services on the quality of vocational education graduates



Students' abilities in digital services or digital services include the ability to use digital technology, understand how applications work, understand the principles of digital security and the ability to solve potential technical problems. These skills can help students prepare to work in an ever-evolving digital age. The main qualifications required in digital services or digital services are, for example: (1) digital literacy, (2) digital security, (3) problem solving, (4) creativity, (5) self-learning ability. Several indicators of digital service ability affect the indicators of meeting the quality of graduates such as: 1) skills and knowledge, (2) attitudes and behaviors, (3) adaptability, and (4) job readiness.

To be able to improve the quality of graduates, apart from meeting several indicators of job readiness and ownership of technical skills, they must also have digital service capabilities. So that some things that must be done are to improve digital service capabilities that will cause graduates to have the ability to think critically, creatively, and innovatively. In addition, digital competence is very important in determining policies to improve the quality of graduates in an educational institution. The effect of digital service capabilities on improving the quality of graduates is in line with the research results of: (Setuju et al., 2021), and (Krumsvik, 2014).

## CONCLUSIONS

Based on theory, the study of relevant articles, conceptual frameworks and also discussions based on the results of studies of previous research, it can be proven the truth of the predetermined hypothesis, that:

1. Job readiness affects the quality of vocational education graduates.
2. Skills affect the quality of vocational education graduates.
3. Digital services affect the quality of vocational education graduates.

To get good quality for graduates from vocational education institutions, what must be considered is that students must have work readiness as the basic capital in carrying out their duties while working in the industrial world. There are at least a few things that must be done so that students have work readiness including: (1) professional skills, (2) interpersonal skills, (3) mental and emotional readiness, and (4) willingness to learn. If the four indicators of job readiness can be met properly, it will get a good quality of graduates. The skills of stud

ents are also an indicator of success from the high quality of graduates, because the needs of the industrial sector for the workforce, of course, are those who have several skills to support production results and also suppress work accidents due to human negligence. There are at least four indicators of a learner's possessiveness, namely: (1) writing skills, (2) speaking skills, (3) non-verbal communication skills and (4) listening skills. last of several facto

rs that affect the quality of graduates is that students have the ability in terms of digital services. These digital services include: (1) digital literacy, (2) digital security, (3) problem solving, (4) creativity, (5) self-learning ability. Digital service capabilities are a must in industry players in the current 4.0 era.

Based on the conclusions above, the advice in this article is that there are many other factors that affect the quality of vocational education graduates, apart from job readiness, skills, and digital services at all types and levels of organizations or companies. Therefore, further studies are still needed to find out what other factors can affect the quality of vocational education graduates in addition to the variable ones studied in this article. Based on the results of the study of several previous studies in this article study, it was found that there are other factors that affect the quality of graduates, such as: (1) disciplinary attitude, (2) independence, and (3) academic achievement. These three factors can be further researched both in the method of literature studies and other empirical studies.

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