

A SNAPSHOT OF INDONESIAN VOCATIONAL EDUCATION AND THE 21ST CENTURY SKILLS CHALLENGE

Loso Judijanto *1

IPOSS Jakarta, Indonesia

losojudijantobumn@gmail.com

Hasdiana

Universitas Negeri Gorontalo

has_diana@ung.ac.id

Ulin Naini

Universitas Negeri Gorontalo

ulinnaini@ung.ac.id

Al-Amin

Universitas Airlangga, Surabaya, Indonesia

al.amin-2024@feb.unair.ac.id

Abstract

Vocational education in Indonesia faces various challenges in preparing competent and adaptive human resources for the 21st century. Despite various initiatives to improve the quality and relevance of vocational education, educational institutions still struggle with a less dynamic curriculum, limited infrastructure, and lack of collaboration with industry. As a result, vocational education graduates are often unprepared for the fast-changing and highly-skilled world of work. This challenge calls for a comprehensive reform of the vocational education system, involving the integration of 21st century skills such as adaptability, collaboration, critical thinking and digital literacy into the curriculum. It is also necessary to encourage strong partnerships between educational institutions and the industrial world to create a curriculum that is relevant and in line with labour market needs. In addition, the application of modern technology in the learning process, comprehensive training for teaching staff, and the development of high-quality vocational centres need to be prioritised. With consistent and coordinated reforms, vocational education in Indonesia is expected to be able to act as the main pillar in supporting the availability of competent and qualified human resources, and be able to compete at the global level. This will require close collaboration between government, industry and educational institutions to address the 21st century skills challenges and contribute to the nation's economic and social development.

Keywords: Portrait, Vocational Education, Indonesia, 21st Century Skills Challenge.

¹ Correspondence author

Introduction

Vocational education in Indonesia plays an important role in preparing skilled and work-ready human resources. This education aims to produce graduates who have practical competence and are ready to face the industrial world.

Vocational education is a type of education that focuses on developing practical and technical skills needed to enter the workforce directly. Through this education programme, students are trained to master specific competencies in various fields such as engineering, health, tourism, and business management, with a learning approach that is mostly done through real practice and direct experience in the field (Hamzah, 2020). Vocational education aims to prepare graduates to be ready to work with abilities that are relevant and in accordance with industry needs. Unlike academic education which is more theoretical, vocational education prioritises the application of practical skills that can be immediately implemented in a professional environment (Cleovoulou, 2021).

Vocational education has a significant role in preparing a reliable and competent workforce to meet the growing needs of the industry. By focusing on the development of practical and technical skills, vocational education helps graduates to be able to immediately adapt and make effective contributions in the workplace (Eneng, 2023). This is a solution to reduce the gap between the skills possessed by graduates and the needs of the industry, thereby accelerating the recruitment and job adaptation process. In addition, with vocational education, companies do not need to spend a lot of time and money to train new employees from scratch because they already have the basic skills needed (Fitria et al., 2023).

Aside from the industry side, vocational education is also important to create greater opportunities for individuals who want to enter the workforce immediately after completing formal education. By offering appropriate and relevant training, vocational education opens wider opportunities for graduates to obtain decent jobs and touch economic welfare. It can also encourage increased productivity and innovation as the workforce is armed with specific and up-to-date skills according to technological developments and industry trends (Santosa, 2022). Ultimately, vocational education contributes significantly to improving the quality of human resources in a country and supporting sustainable economic growth. However, in the midst of changing times and increasingly complex industrial needs, vocational education in Indonesia is faced with various challenges. (Hidayatulloh & Ashoumi, 2022)

In the era of globalisation and industrial revolution 4.0, there is a demand for specific skills known as 21st century skills. These skills include critical thinking, creativity, collaboration, communication, digital literacy, and the ability to adapt to technological change. According to a report from the World Economic Forum (WEF), these skills are urgently needed to respond to the evolving demands of the world of work (Sitopu et al., 2024); (Hairiyanto et al., 2024); (Fawait et al., 2024).

Vocational education in Indonesia is still faced with various challenges such as teaching quality, curriculum relevance to industry needs, and lack of practical facilities. Many vocational education institutions are still unable to provide adequate facilities and infrastructure, and collaboration between education and industry still needs to be improved. This causes vocational education graduates to sometimes be less prepared to face the realities of the world of work (Karstensen & Aakernes, 2024).

Some of the main challenges faced by vocational education in Indonesia in preparing 21st century skills are Curriculum that is Not Up-to-Date, Quality of Teachers, Collaboration with Industry, Digital Literacy (Eryandi & Nuryanto, 2020).

To face these challenges, strategic steps are needed involving the government, industry, and educational institutions. Improving the quality of vocational education will greatly determine the readiness of Indonesia's young generation to face global competition and contribute to national economic development.

Research Methods

The study in this research uses the literature method, which is an approach used to collect and analyse data from various written sources, such as books, journal articles, and other documents. This method is very important in research because it allows researchers to gain an in-depth understanding of a particular topic based on pre-existing studies. By conducting literature research, researchers can identify gaps in the existing literature, develop theoretical frameworks, and formulate more targeted hypotheses. (Hidayat, 2009); (Afifyanti, 2008); (Syahrizal & Jailani, 2023).

Results and Discussion

Concept of Vocational Education

Vocational education is a form of education that focuses on developing the technical and practical skills required for a particular occupation or industry. The main objective of vocational education is to prepare learners to work professionally after completing their education (Uyar, 2023). This education usually includes hands-on training and internships in a real work environment, so that learners can apply the theory acquired in a practical context. Vocational education covers a wide range of programmes in fields such as technology, health, services and commerce (Søreide et al., 2021).

A key characteristic of vocational education is its strong practical orientation, designed to produce graduates who are work-ready and have specific skills required by industry. These education programs often involve collaboration with companies and organisations to identify skills needs and design appropriate curricula (Singh, 2021). In addition, vocational education usually offers certifications or diplomas that can increase graduates' competitiveness in the labour market. The flexibility and variety of

specialisation options in vocational education also allow learners to choose a career path that best suits their interests and talents (Young, 2022).

The history of vocational education in Indonesia dates back to the Dutch colonial period with the establishment of technical and vocational schools to meet the need for skilled labour for industry and infrastructure development. In the early 20th century, the Dutch colonial government established the first technical schools in Bandung and Surabaya (Komba & Shukia, 2023). These schools aimed to provide practical training to Indonesian youth to fill the positions of technicians and labourers in important sectors such as agriculture, plantations and manufacturing industries. This education model continued to be developed until independence (Waloyo, 2022).

After independence, the Indonesian government realised the importance of vocational education for national development and the improvement of people's welfare. In 1953, the government established the Technical School Council (DST) which was tasked with formulating technical and vocational education policies and programmes (Erten, 2022). Subsequently, in the 1970s, vocational education underwent major reforms with the introduction of Repelita (Five-Year Development Plan) which emphasised the importance of developing skilled human resources through vocational education. Programmes such as Vocational High Schools (SMK) and Polytechnics were established in various regions to accommodate the need for professionals in various industrial fields (Papadakis, 2022).

Entering the modern era and globalisation, vocational education in Indonesia continues to be adapted to the demands of the global labour market. The government is increasingly strengthening cooperation with industry and the business sector to align curricula and training programmes with labour market needs. Initiatives such as the introduction of competency-based curricula, national and international certifications, and industrial internship programmes have become an integral part of vocational education (Kurata, 2023). In addition, vocational education was also extended to the higher education level through the establishment of public and private polytechnics that offer diploma, undergraduate, and even postgraduate programmes in technical and professional fields. This transformation demonstrates the government's commitment to improving the quality and relevance of vocational education to prepare a competent Indonesian workforce that is ready to compete in the global era (Rahimi, 2023).

21st Century Skills

21st century skills refer to a set of competencies needed to face the challenges and opportunities in the modern era driven by technology and information. These skills include critical and creative thinking, collaboration, effective communication, digital literacy, and the ability to adapt quickly in a changing environment (Reikosky, 2023). In addition, social and emotional skills such as empathy, cultural awareness and leadership

are also a vital part of these skills. Education and training that focuses on developing 21st century skills aims to ensure individuals are prepared for the complex dynamics of the world of work and are able to become innovators and reliable problem solvers in various fields (Corrigan & Merry, 2024).

Cognitive skills include the critical, analytical and logical thinking abilities needed to solve problems, make informed decisions, and understand and evaluate the complexity of situations. This includes the ability to collect, sort and interpret data; think systematically; and evaluate evidence and arguments. Cognitive skills also include information literacy, which enables individuals to navigate and assess information from a variety of different sources (Reed, 2020).

Creative skills involve the ability to generate new ideas, think of innovative solutions, and approach problems with different perspectives. This includes flexibility of thinking, imagination, and the ability to connect seemingly unrelated concepts to create something unique and useful. In addition, creative skills also include the ability to develop and apply new concepts in a practical context, be it in art, design, technology, or in everyday life (Ghafar, 2020).

Technical skills refer to certain competencies required to perform specialised tasks in a particular technology, industry or occupation. This includes the ability to operate tools and machinery, master computer software, understand technical principles and practise techniques and procedures relevant to a particular job or hobby. Technical skills are particularly important in today's digital age, where almost every industrial sector requires mastery of certain technologies to improve efficiency and productivity (Darbellay et al., 2023).

Social and emotional skills include the ability to interact effectively with others, build healthy relationships, demonstrate empathy and manage conflict. It also includes emotional intelligence—the ability to recognise, understand and manage one's own emotions as well as understand the emotions of others (Voogt & Roblin, 2023). These skills are important in building co-operation, facilitating clear communication, as well as strengthening leadership abilities. Given the increasingly collaborative work and social environments, social and emotional skills are essential to achieve individual and team success in a variety of contexts (Vista, 2020).

Thus, 21st century skills cover a wide range of complementary categories that are necessary to cope with the dynamics of the modern world. Cognitive skills such as critical and analytical thinking help one to navigate complex information and make informed decisions. Creative skills enable individuals to find innovative solutions and generate new ideas. Technical skills are required to master specialised tools and technologies relevant to various fields of work. Meanwhile, social and emotional skills are important for building healthy relationships, communicating effectively and working well in teams. The combination of all these skills helps individuals to be more adaptive, productive and ready to face challenges and opportunities in an ever-changing era.

A Portrait of Vocational Education in Indonesia

Vocational education in Indonesia has become a major focus of the government in an effort to improve the skills and readiness of the workforce to face global challenges. Vocational High Schools (SMK) and Polytechnics are the two main vocational education institutions that provide programmes geared towards meeting industry needs (O'Bryan & Harrison, 2024). These programmes are designed to provide technical and practical skills that are directly applicable to the world of work. However, despite efforts to improve curricula to be more relevant to industry needs, there are still challenges that need to be addressed, one of which is the gap between graduates' competencies and the needs of the job market (FFE et al., 2022).

In addition, co-operation between vocational education institutions and industry is still at a developmental stage. Many companies have not fully involved themselves in the education process by providing training, internships, or direct guidance in the workplace. This results in vocational education graduates often lacking the practical experience required by the industry. Other constraints include limited facilities and inadequate educational equipment, which means that many students do not get the opportunity to learn using the latest technology that is being used in actual practice (Mutohhari et al., 2021).

The Indonesian government continues to address these challenges through various initiatives, such as strengthening co-operation between educational institutions and industry and improving the quality and relevance of curricula. Scholarships and other support programmes have also been introduced to attract more students to the field of vocational education (Camasso et al., 2021). By improving the status and quality of vocational education, Indonesia hopes to reduce the unemployment rate and increase the competitiveness of its labour force in the global market. Increasing public awareness and appreciation of vocational education is also an important step in this endeavour (Krasniqi, 2021).

To ensure the success of vocational education in Indonesia, special attention also needs to be given to improving the quality of teaching staff. Training and professional development for teachers and lecturers in vocational fields are essential to ensure they are able to teach relevant and up-to-date skills in accordance with industry developments (Vilalta-Perdomo et al., 2022). Certification programmes and increased compensation can be positive steps to attract qualified individuals into teaching in vocational institutions (Luan & Nowacki, 2021).

In addition, the integration of technology in the vocational learning process plays a key role in improving the effectiveness and efficiency of education. The use of technologies such as virtual simulation, data analysis, and automation tools can provide students with a more immersive and realistic learning experience. However, these initiatives require considerable investment in infrastructure and technological support,

which must be well managed by the government and related parties (Judijanto et al., 2024).

Going forward, continuous evaluation and adaptation of vocational education strategies should be conducted to adjust to the changing times and industry needs. The active involvement of stakeholders, including the government, industry, educational institutions and the community, is essential to create a holistic and responsive vocational education ecosystem. With a joint commitment, it is hoped that vocational education in Indonesia can develop into a strong pillar in economic and social development, and be able to produce a workforce that is ready to face challenges and take advantage of opportunities in the modern era of globalisation.

21st Century Skills Challenge

Facing the skills challenges of the 21st century, adaptability and lifelong learning are crucial qualifications. In this era of uncertainty and rapid change, the ability to continuously learn, adapt and reskill is the difference between success and failure (Tubagus et al., 2023); (Aslan & Shiong, 2023). Digital transformation and the rapid development of technology require workers to keep up with the latest trends and update their skills according to the evolving needs of the industry. Therefore, continuous education and training is a non-negotiable foundation (Nurdiana et al., 2023).

Another key competency of 21st century skills is collaboration and interpersonal skills. In an increasingly global and connected work environment, the ability to work with people from diverse cultural, linguistic and disciplinary backgrounds is indispensable (Eslit, 2023). Effective communication and good teamwork skills are key to the success of major projects and initiatives. Workers are not only required to be able to work together but also to solve problems collectively and manage conflicts in a constructive way (Muzambi & Goosen, 2022).

Critical thinking and creativity are also vital elements in meeting the skills challenges of the 21st century. Modern workers must have the ability to analyse information in depth, make sound decisions based on data and solve problems in innovative ways. Creativity is a key driver in creating new solutions and producing unique and value-added products or services (Amimo, 2021). Therefore, the education and training system must support the development of critical and creative thinking skills from an early age.

The challenge of 21st century skills comes not only from the realm of technology and collaboration, but also from the importance of digital literacy and ethics. With more and more information available digitally, the ability to filter, verify and use information ethically has become crucial (Berk, 2022). Digital literacy includes an understanding of privacy rights, cybersecurity and ethics in the use of technology. People need to be

trained to be responsible users of technology and understand the ethical implications of their actions online (Haddar et al., 2023).

By addressing these four aspects-adaptability, collaboration and interpersonal skills, critical thinking and creativity, and digital literacy and ethics-individuals and organisations can be better equipped to face the challenges of this dynamic century.

Conclusion

A snapshot of vocational education in Indonesia and the 21st century skills challenge shows that vocational education in Indonesia still faces many challenges to fulfil the competency needs in this digital era. Despite various initiatives to improve the quality and relevance of vocational education, many educational institutions still struggle with less dynamic curricula, limited infrastructure, and lack of collaboration with industry. This leaves vocational education graduates often underprepared to jump straight into the fast-paced, high-skilled world of work.

To address these challenges, Indonesia's vocational education system needs to undertake a thorough reform by integrating 21st century skills such as adaptability, collaboration, critical thinking and digital literacy into the curriculum. In addition, it is important to encourage strong partnerships between educational institutions and industry to ensure that the training provided is relevant and up-to-date with labour market needs. This approach should also include the use of modern technology in the learning process, the provision of comprehensive teacher training, and the development of vocational centres with international standards.

Thus, vocational education in Indonesia can become the main pillar in supporting the availability of competent and qualified human resources, who are able to compete in the global arena. This reform requires consistent and coordinated efforts from all stakeholders, including government, industry and educational institutions. Only in this way can vocational education play its fullest role in addressing the skills challenges of the 21st century and contribute to nation-building.

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