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Training Need Analysis for the Development of Digital Skills with Competency Certification in the Digital Era: A Study of University Students and Employees in Jakarta, Indonesia

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ABSTRACT
Technological advancements in the Digital era demand adaptive digital competencies from university students and employees. This study aims to analyze digital training needs and the role of competency certification, particularly from the National Professional Certification Agency (BNSP), in enhancing workforce readiness. A qualitative descriptive method was employed using data triangulation through closed-ended questionnaires with 100 respondents, in-depth interviews with 10 participants, and document analysis of training materials. The findings indicate that most respondents recognize the importance of digital skills such as Microsoft Office and data processing. Competency certification improves credibility and competitiveness, especially in financial management, human resource management, and digital marketing. However, challenges remain, including limited training infrastructure, low proficiency in advanced digital tools, and financial barriers. The study recommends stronger institutional support for competency-based training and certification facilitation to bridge digital skill gaps in the digital era.

Keywords: Training Need Analysis, Digital Skills, Competency Certification.
JEL Code: M53, I21, D83.

I. Introduction

The rapid advancement of technology in the digital era has significantly impacted the competencies required in the workforce. Various industrial sectors are expected to adapt to advanced technologies such as the Internet of Things (IoT), big data, artificial intelligence (AI), and automation systems. This transformation demands that students and employees acquire relevant and adaptive digital competencies. Digital competence involves the knowledge, skills, and attitudes necessary to effectively respond to, utilize, and communicate technological changes (Natasha et al., 2025). Supported by training institutions as a learning platform for training and competency testing, training needs can be mapped systematically through competency-based learning programs. Therefore, training needs analysis becomes essential for identifying the skills and abilities required and designing effective training programs. The TNA tool is widely used globally in planning and evaluation. It identifies training needs and supports capacity development strategies, quality

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improvement efforts, and evidence-based policy planning. TNA is effective in bridging the "know-do gap" in the field of human resources (Markaki et al., 2021). In training programs, efforts can be made to improve the quality of human resources; new and old employees need training (Sulistiyono et al., 2024). Digital training encompasses modern technologies to enhance educational processes, professional training, and the overall learning experience (Holiuk et al., 2019; Khamza et al., 2024). The concept of digital skills training today is crucial for those who will compete with workers or individuals with talents. Industrialization involves humans working alongside advanced technology and AI-powered robots to enhance work potential or other skill capabilities. The essence of Industry 5.0 lies in its focus on integrating human creativity and expertise with the capabilities of intelligent systems and automation to improve efficiency, productivity, and environmental sustainability (Cronin & Doyle-Kent, 2022).

Digital skills training is a form of training that helps individuals or groups acquire the necessary skills in the digital era (Seifert et al., 2021). This training can be practical exercises, seminars, courses, and participation in competency certification training and tests. Competency certification ensures that the workforce possesses the knowledge, skills, and work attitudes per the established standards. Thus, it is expected that the Indonesian workforce can become more competent, productive, and competitive. The government has issued various regulations related to competency certification, such as Law Number 13 of 2003 concerning Manpower, 2003 concerning Manpower, and Government Regulation Number 10 of 2018 concerning the National Professional Certification Agency (BNSP). These regulations govern competency standards, certification bodies, and the certification process. Despite these regulations, challenges remain in their implementation, including a lack of awareness among industries and the public regarding the importance of certification and a limited number of qualified Professional Certification Institute (LSP). Consequently, identifying the digital training needs of students and employees has become increasingly essential (Popkova & Zmiyak, 2019). This study aims to analyze the implementation of government policies on digital competency certification and to identify the training needs of students and employees in Jakarta. The central research question addressed is: "What are the essential digital skills required, and how can competency certification support workforce readiness in the digital era?".

II. Literature Review and Hypothesis Development

2.1. Human Resource Training

Dessler (2017) defines training as teaching new or newly hired employees the basic skills required to perform their jobs. On-the-job training is training someone to learn a job while doing it, and off-the-job training is employees learning in a controlled environment outside the workplace, such as seminars, role plays, and case study methods. Danvila-del-Valle et al (2019) consider HR training as an investment in human capital that can increase productivity, employee loyalty, and company performance. Formal and informal training significantly impact HR performance in areas such as customer service, acceptance of new technology, professionalism, and adaptability to change (Kakarougkas & Papageorgakis, 2023). Research shows that training and development directly impact improving organizational performance. Effective programs help enhance skills, knowledge, attitudes, productivity, and job satisfaction, and reduce team member turnover. Training has been proven to reduce workplace accidents, tardiness, and absenteeism. Employees feel more confident, loyal, and engaged after training and development (Ismael et al., 2021). Training is a key factor in developing HR performance and improving organizational effectiveness.

2.2. Training Need Analysis (TNA)

Training is a systematic educational process aimed at improving abilities, knowledge, and behavior and acquiring specific skills under the guidance of instructors (Ridwan et al., 2024). Training Needs Analysis (TNA) is a systematic process used to identify and analyze the gap between actual and desired performance

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at both the individual and organizational levels. This process aims to determine whether training is needed to address these performance gaps, who needs the training, the appropriate type of training, and the expected outcomes (Cotes & Ugarte, 2021). According to Dipboye (2018), TNA functions to map out the discrepancy between ideal performance and real performance. The greater the difference, the more urgent the need for training interventions for specific individuals or groups. Training and development needs assessment helps companies determine if training is needed. Training needs analysis can be done by conducting organizational, task, and individual analyses (Mondy & Martocchio, 2016).

a. Organizational analysis focuses on the company's strategic mission, goals, and plans, which are studied along with the results of strategic human resource planning.
b. Task analysis focuses on the tasks required to achieve company goals.
c. Person analysis is a training needs assessment activity that focuses on answering questions such as Who needs to be trained? What do they need to do differently from what they are doing today? What knowledge, skills, and abilities (KSAs) do employees need?

Suksutdhi's (2024) research identified seven main components that influence performance, which are part of the HR training and development innovation model, namely:

a. Classroom Training: Transferring knowledge and experience through operational simulations and group discussions.
b. Teaching (Coaching / Mentoring): Providing direct or group guidance to mentors or supervisors.
c. Practice Training: Training by working directly on the spot, using a problem-solving approach.
d. Blended Learning: Combining online and face-to-face learning, allowing for more flexible learning for employees.
e. Job Rotation: Staff rotation between departments to expand their skills and work experience. Study Tour for Learning: Field visits to learn best practices
f. Learning through Playing Games: Using games as a learning method to improve social interaction and teamwork.

A study conducted by Mayombe (2021) examined the implementation of TNA in vocational skills training for unemployed youth in the city of eThekwini, South Africa. Using the eThekwini Municipal Academy (EMA) as a case study, the research found that TNA effectively designed training programs aligned with local labor market needs. By consulting with employers, EMA identified specific skills shortages and then developed targeted and practical training curricula for prospective workers.

2.3. Digital Skills

According to Carlisle et al (2023), digital skills use information and communication technologies to perform operations and services efficiently. This includes the use of software and systems (such as MS Office, operating systems, websites), digital communication (social media, online marketing, customer review monitoring), advanced technologies (AI, robotics, data analytics, AR/VR), and digital safety and security (cybersecurity and online safety procedures). Findeisen & Wild (2022) state that digital transformation is reshaping the world of work and requires a workforce equipped with digital competencies and skills such as problem-solving and critical thinking. Rachman et al (2024) research HRM training is essential to help HR and marketing professionals by utilizing digital tools such as ChatGPT to help create more personal and relevant experiences for audiences and open up opportunities to increase the efficiency of marketing strategies. Digital training offers broader, more flexible, and sustainable access. While online soft skills training was once considered difficult, technology now enables effective development in digital formats. Soft skills such as

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communication, collaboration, empathy, and leadership are becoming increasingly important in the modern workplace (Coelho & Martins, 2022).

2.4. Competency Certification

Pabiangan (2024) explains that competency certification has a significant positive impact on working conditions in Indonesia. This includes enhancing individual competencies, improving job placement accuracy, increasing employee welfare, and ensuring workplace safety. Overall, certification supports improving workers' quality of life and creates a safer and more productive work environment. Certification serves as a validation tool for workers' capabilities and is vital in enhancing workforce competitiveness in the global era (Suryadi et al., 2019). In practice, professionals often face fragmented and non-integrated digital systems. Many training programs are conducted through self-learning approaches, but an underdeveloped infrastructure constrains these. Additionally, many practitioners lack basic digital skills, such as operating standard software. Therefore, it is essential to provide contextual and integrated digital training within a competency-based learning framework (Iyamu et al., 2025).

III. Research Method

This study adopts a qualitative research design with a descriptive analytical approach, aiming to explore the effective development of digital skills among students and workers in the context of the digital era. The research maintains originality by focusing on a specific population of students and employees who have actively engaged in certification programs, an area that remains underrepresented in prior studies. The study distinguishes itself by integrating perspectives from education and employment sectors, thus contributing novel insights to the discourse on digital competency development.

3.1. Research Questions

The following questions guide the research:

a. How do students and workers perceive the importance of digital skills in the digital era?
b. What role does certification play in supporting digital skill development?
c. How can BNSP competency certification help develop competencies in your education and workplace?
d. What challenges are commonly faced in the process of acquiring digital competencies?

3.2. Research Design and Data Collection

The study employs three main data collection techniques to ensure triangulation and data validity:

a. Closed-ended questionnaires were distributed to 100 measure perceptions, experiences, and outcomes related to digital skills and certification.
b. In-depth interviews were conducted with a purposive sample of 10 respondents (university students and employees) who had undergone multiple certifications and actively use their competencies in academic or professional settings. Selection criteria included frequency of certification participation, field of study/work, and voluntary consent.
c. Document analysis was performed on training syllabi, certification modules, and related institutional records to understand the alignment between training content and workplace requirements.

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3.3. Sampling Method

The sample of 100 respondents was selected through purposive sampling, targeting individuals with direct experience in digital skills certification programs. This method ensures the relevance and richness of the data collected. Interview participants were chosen based on their active involvement in competency development, field diversity, and willingness to share detailed insights.

IV. Results and Discussion

4.1. Students' and Workers' Perceptions of the Importance of Digital Skills in the Digital Era

The findings indicate that most respondents, students and workers, recognize the importance of digital skills in supporting their academic and professional activities, particularly in Industry 5.0. According to the survey, 96.7% of respondents use digital devices daily, strongly relying on technology in their daily routines. Foundational digital competencies such as Microsoft Office (90%) and data processing (83.3%) were considered essential. From the results of interviews with 10 university students and employees, using technology to support work is very helpful in completing tasks, and this also requires learning digital skills. These results affirm that digital literacy is no longer an optional skill but a core competency required to face current and future challenges. This reflects the shift toward Society 5.0, where technology and information systems are the backbone of various life sectors (Deguchi et al., 2020). In research conducted by Istiqhotsah et al (2024), technology effectively supports employees in completing tasks and meeting service requirements. Gawrycka et al.'s (2021) research results show that most students and graduates assess their competencies (specialist, social, managerial, digital) as good. Additional training outside the primary curriculum helps improve work readiness.

4.2. The Role of Certification in Supporting Digital Skill Development

Digital competency certification plays a crucial role in formally validating an individual's acquired skills. The survey reveals that 53.3% of respondents are interested in participating in digital training programs offering certification, while another 40% are interested. This high interest indicates a strong need for formal recognition of digital skills, which are not always acquired through traditional education. The results of the interviews with 10 university students and workers showed that having a certificate can help them understand the work given. Certification also serves as a motivator for structured and goal-oriented skill development. Certified credentials enhance credibility in the job market and improve individuals' chances of success in an increasingly competitive workforce. This aligns with research by Raras et al. (2023), which states that competency certification significantly improves employee performance and acts as an important mediating variable that strengthens the influence of knowledge and skills on performance. The research of Zhao et al (2021) explains that digital competence is the ability to use technology confidently, critically, and responsibly in daily life, work, learning, and social interactions. The research results show that Digital competence has a significant positive effect on student learning behavior. Students with high digital competence tend to show more active, independent, and productive learning behavior. The level of digitalization in higher education institutions (DHEI) strengthens the influence of digital competence on learning behavior. Institutions with good digital infrastructure and resources have a greater impact on optimizing student abilities.

4.3. The Role of BNSP Certification in Developing Competencies in Education and the Workplace

Certification issued by the National Professional Certification Agency (BNSP) is perceived to provide tangible benefits in both educational and professional contexts. According to the data, 46.7% of respondents

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stated that BNSP certification significantly helps develop workplace competencies, while another 46.7% said it helps somewhat. The most in-demand areas for BNSP certification include:

a. Financial Management (60%)
b. Human Resource Management (56.7%)
c. Digital Marketing (53.3%)

These findings suggest that certification enhances technical skills and graduates' and workers' competitiveness in strategic fields highly valued by the industry. Thus, BNSP certification is a critical bridge between educational outcomes and workforce needs. The results of interviews with 10 university students and workers showed that the BNSP certificate helped them become professionals in their fields because it meets national standards. With the BNSP Certificate, university students can prepare for a career. Employees can also get a promotion and a salary increase. The results of the study Efendi & Yusuf (2021) Showed that competence has a positive but not statistically significant effect on the performance of BNSP employees. Hidayat et al (2024) Competency certification has a significant effect on improving the quality and performance of front office employees. Certified employees have better knowledge, skills, and work attitudes. This has resulted in more professional service and positive responses from hotel guests. Candra et al., 2025) Explained that the BNSP Certificate increases the competitiveness of graduates in the world of work and improves the quality of standardized workers. Training and test simulations help students understand the flow and standards of BNSP certification. Mentoring from LSP assessors helps students improve skills that are still lacking.

4.4. Challenges in Acquiring Digital Competencies

Despite the widespread acknowledgment of digital skills' importance, several challenges hinder their acquisition. One major issue is the lack of adequate infrastructure for practical digital training. Self-learning practices often fall short due to the absence of integrated digital learning systems. Furthermore, many individuals only possess basic digital literacy, limited to programs like Microsoft Word, and lack proficiency in more advanced applications such as Excel, data analytics, or cloud platforms. This reveals a clear skills gap that must be addressed through contextual, competency-based training. Respondents' preferences for training methods also highlight another challenge. As many as 66.7% preferred in-person training, indicating a strong need for direct, hands-on interaction with instructors. Meanwhile, 50% were open to online training, though the effectiveness of this method still depends heavily on technical readiness and content quality. The results of interviews with 10 university students and employees who are mastering digital skills show a lack of access to follow-up training and a fixation on the technology commonly used for work. Moreover, when there is training and certification, it is constrained by costs. However, the interview results also showed that several offices finance training and certification, and some individuals pay for it themselves. A study by Mbambo & du Plessis (2025) On the level of digital skills, it was found that many students begin university without basic computer skills. Most are only familiar with Microsoft Word, while proficiency in Microsoft Excel and other applications remains very low.

V. Conclusion

This study highlights the critical role of Training Need Analysis (TNA) in identifying and addressing the digital skill gaps among university students and employees in the digital era. TNA is a strategic tool to systematically assess current competencies, determine skill deficiencies, and design targeted training programs that align with workforce demands. Through TNA, institutions and organizations can better understand which digital skills are most needed and how best to develop them through effective training interventions. A key finding of this research is the strong relevance of competency certification as one

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outcome of the TNA process. Certifications, particularly those issued by Badan Nasional Sertifikasi Profesi (BNSP), are vital in validating digital competencies, enhancing employability, and improving workforce quality. The study reveals that participants view certification as a formal recognition of skills and a motivating factor for continuous learning and career advancement. Despite these benefits, the study identifies challenges such as limited training infrastructure, financial barriers to certification, and gaps in advanced digital skills. These obstacles underscore the need for more inclusive, accessible, and competency-based training models. Implementing TNA as a foundation for structured digital skills training and competency certification is essential to preparing a competitive, adaptive, and digitally literate workforce in the digital era. Support from companies and universities in providing facilities and resources for certification test participants is important in improving training outcomes.

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