

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

INTEGRATING DIGITAL SKILLS INTO PROJECT-BASED LEARNING IN HIGHER EDUCATION TO ADDRESS SHIFTING WORKPLACE TRENDS IN INDONESIA

Diandra Varalaksita Ayudyanita¹, Ferdian Ahya Al Putra²

¹Slamet Riyadi University

²Universitas Sebelas Maret

*Corresponding Author: Ferdian Ahya Al Putra. Email: ferdianahya@staff.uns.ac.id
ORCID: <https://orcid.org/0000-0002-5187-0204>

Technological advancements have driven increasingly dynamic job trends in Indonesia each year. This situation becomes problematic when a gap emerges between the skills possessed by college graduates and the criteria required in the workplace. According to the World Economic Forum (WEF), current job trends are moving towards various jobs related to digitalization, such as data analysts, digital marketers, and strategy specialists. Meanwhile, the curriculum of various courses in Indonesia remains conventional, resulting in graduates' skills being unable to meet job market needs. This study discusses the integration of digital skills into Project-based learning (PjBL) as an effort to equip students with the skills needed in the workplace. This study uses a qualitative descriptive method, with data collection techniques using library research techniques. This study uses the concept of Digital Skills as an analytical tool to help answer the research objectives. The results show that familiarizing students with the use of digital tools and various platforms to academic activities can equip them with the digital skills needed in the workplace support. On the other hand, INDEF records in 2023 showed that the digital literacy rate in Indonesia was only 62%, the lowest compared to other ASEAN countries, which averaged 70%. Integrating digital skills into project-based assignments can be one solution to improve people's digital skills.

Keywords: Digital Skills, Indonesia, Project-Based Learning, Workplace Trends

1. Introduction

Rapid technological developments have brought about significant changes in workplace trends. These developments required graduates to possess specialized technological expertise, particularly in utilizing various digital platforms that have become widely used in the workplace. Automation of production in factories reduces the need for human labor, while the use of advanced software and algorithms replaces routine tasks in the administrative sector. Furthermore, technology, automation, and artificial intelligence (AI) have significantly impacted the job structure and skills required in various industrial sectors (Buleleng Manpower Office, 2025). These conditions require Human Resources (HR) to be able to adapt to technological developments. Graduates and

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

workers cannot be controlled by increasingly sophisticated technology. Instead, they must be able to utilize technological developments to support their work as effectively as possible, thus producing output that meets consumer and community needs.

However, technological developments create a gap between graduate skills and job market needs. Indonesia faces significant challenges in improving the competitiveness of its workforce. The proportion of medium- and high-skilled workers in Indonesia is only 39.57 percent, significantly lower than other ASEAN countries such as Malaysia and Singapore (Wardhana et al., 2024). The shortage of workers with advanced digital skills (STEM) also remains a major national challenge. The number of graduates in Science, Technology, Engineering, and Mathematics (STEM) in Indonesia is quite low, at 0.8 per 100 graduates, significantly lower than in other countries such as China (3.4) or India (2.0) (Gayatri et al., 2023). One cause of this gap is the mismatch between the Indonesian National Qualifications Framework (KKNI) and industry needs, which often result in specific training that is less relevant to the realities of work (Wardhana et al., 2024). These data demonstrate problems in educational governance and job market needs. This also emphasizes the importance of adapting the curriculum to current technological developments to meet the qualifications required by employers. Previous studies have analyzed the implementation Project-Based Learning (PjBL), at various levels of education in Indonesia. PjBL refers to a student-centered learning model in which learners actively engage in in-depth exploration of specific topics through projects designed to address real-world problems or to answer complex questions (Asfihana et al., 2022; Kurniawan et al., 2024; Rosmiati et al., 2025). This model is grounded in Constructivism, which conceptualizes learning as a natural process whereby meaning is constructed by learners through interaction and reflection on their ideas and experiences (Al-Abdullatif & Gameil, 2021; Chen & Yang, 2021; Rahman et al., 2025).

A study found that high school students in Surakarta regularly use smartphones for more than 6-7 hours a day to gather information or download learning materials, and they believe in the positive benefits of using these devices, thus implying the importance of using technology in teaching and learning activities (Sari et al., 2020). Subsequent research conducted bibliometric insights to explore the implementation of Project-Based Learning (PjBL) integrated with the STEAM (Science, Technology, Engineering, Art, Mathematics) approach to improve students' creative thinking skills in Indonesia. The study found that PjBL-STEAM, which is based on contextual issues or is relevant to students' daily lives, is able to develop creative thinking skills (Prasetyawati & Astuti, 2025). Rahman et al. (2025) investigated the impact of Project-Based Learning (PjBL) on the development of 21st-century skills in junior high school students in Indonesia, emphasizing the importance of integrating 21st-century skills into learning practices. Several studies have emphasized the importance of technology integration in the curriculum and teaching and learning activities. However, these studies have not specifically addressed its relevance to the world of work.

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

On the other hand, regarding the world of work, Gayatri et al. (2023) projected Indonesia's digital labor gap for 2021–2025 and found that the supply of digital workers would exceed demand, estimated at 600,000 workers per year. Research by Sulintang et al. (2024) further highlighted the scarcity of studies linking fintech developments to employment issues, despite fintech offering promising career prospects. The authors observed a knowledge gap in these studies. Previous research has not specifically linked the integration of digital skills based on project-based learning to shifting workplace trends. Therefore, the authors conducted this study to address this gap.

Based on the various data and information above, it is understandable that there is a gap between the digital skills possessed by graduates and the skills needed in the workplace. The workplace trend has transitioned to technology-based skills, which require workers to be skilled in operating various tools. This gap arises from various factors, such as the curriculum not adapting to technological developments. Therefore, this study will analyze the process of integrating digital skills into PjBL as a response to shifting workplace trends in Indonesia. This research focuses on the implementation of PjBL in higher education.

2. Methods

This research employed qualitative methods. Qualitative methods are research procedures that produce descriptive data in the form of spoken or written words, or policy actions (Moleong, 2012). This research employed document analysis to obtain data and information. Document analysis is a systematic procedure for examining or evaluating documents, both printed and electronic (computer-based and delivered via the internet). The purpose of document analysis is to gain meaning, understanding, and developing empirical knowledge (Bowen, 2009; Corbin & Strauss, 2008). These data collection methods and techniques were used to analyze the integration of digital skills in PjBL in response to shifting job trends in the Indonesian workforce. The concept used in this research is digital skills.

The concept of digital skills is part of the concept of digital literacy. "Digital literacy" is used as an umbrella term for various technological literacies, such as information literacy, computer literacy, and media literacy. Digital literacy is simply defined as the awareness, ability, and behavior of using information technology. Digital literacy consists of four pillars: digital skills, digital ethics, digital culture, and digital safety (Azanda et al., 2024; Siberkreasi, 2023). In this context, digital skills refer to an individual's ability to know, understand, and use ICT hardware and software, as well as digital operating systems, in everyday life (Hari & Prihantoro, 2023). This concept is used by the authors in this study to examine how digital skills can help students produce quality output through Project-Based Learning (PjBL). The combination of digital skills and Project-Based Learning (PjBL) can familiarize students with mastering the skills needed in the workplace, thus utilizing this concept as an analytical tool in this paper..

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

3. Results and Discussion

3.1. Digital Potential and Gap in Indonesia

Technology has become ingrained in various aspects of people's lives, including university students. Sari et al. (2020) found that students regularly use smartphones (more than 6–7 hours a day) to gather information or download course materials. Respondents in the study noted that the use of mobile devices aids in mastering new material and has a positive impact on students' psychological and cultural aspects (Sari et al., 2020). In a professional context, technology has become a crucial instrument in supporting the operational activities of various institutions, from government agencies to private companies. Technological advances have given rise to various digital platforms that can support human work. Digital platforms are categorized into various types, such as marketplaces or e-commerce, government services, healthcare services, transportation services, and information services.

However, a problem in this context is the gap between graduates' capacities and the skills needed in the workforce. According to a World Economic Forum report, 54% of workers in Indonesia require retraining to cope with technological change (LPKIA, 2025). Data from the Smeru Institute also shows the same thing; in 2020, it was found that almost half (or 49%) of Indonesian workers were unskilled. They have little exposure to simple digital technology. Less than 1% of workers have advanced skills, namely workers with digital skills who are usually placed in high-level positions (Smeru Institute, 2022). Meanwhile, according to the Head of the Agency, for Indonesia to become a developed country, the development of nine million digital talents is needed by 2030. Currently, Indonesia can only produce between 100,000 and 200,000 digital talents annually. Based on the BPSDM Kominfo's own analysis of Indonesia's digital talent needs for 2023–2030, there was a gap of approximately three years in digital talent in 2020, whereas Indonesia ideally needs an increase to 458,043 digital talents per year (Komdigi, 2024).

The need for digital skills in the workplace is quite diverse. According to the Mark Institute, various digital skills are required in jobs such as social media officers, data analysts, content marketers, and multimedia skills like design and videography (Hira, 2023). These skills can help make work more efficient. For example, data analysts can contribute to various considerations in the policy-making process. On the other hand, social media skills can help a company or institution build a positive image. Furthermore, multimedia skills are essential in marketing activities, particularly in attracting consumers by showcasing visual designs related to a company's or institution's products. In fact, for information services, various online media outlets in Indonesia currently use infographics to package their news. Creating infographics that meet professional standards requires strong multimedia skills. Therefore, graduates and workers must possess at least one or more of these skills to compete in the workforce.

Currently, job trends in Indonesia are shifting from conventional to technology- and digital-based jobs. This shift has become increasingly apparent since the COVID-19

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

pandemic. Several studies have shown a shift in consumer behavior from offline to online consumption due to various government restrictions (Anatan & Nur, 2023; Rakhmawan, 2022). This shift requires businesses and individuals to adopt digital media and information technology to maintain productivity (Rakhmawan, 2022). This shift emphasizes the importance of improving digital skills to meet the requirements for digital-era jobs in Indonesia. Furthermore, for Micro, Small, and Medium Enterprises (MSMEs), operational digitization is the "best solution" for survival amidst the disruptions of the pandemic (Anatan & Nur, 2023).

Despite the digital divide, Indonesia has significant digital potential. According to a survey by the Indonesian Internet Service Providers Association (APJII), the majority of Indonesians are connected to the internet, creating a vast digital market. By 2025, the total number of Indonesians connected to the internet will reach 229,428,417, or 80.66% of the total population. Internet penetration rates have continued to increase, growing from 64.80% in 2018 to 80.66% in 2019 (APJII, 2025). Gen Z (89.12%) and Millennials (87.8%) have the highest penetration rates, indicating that the digital market is driven by the younger generation. Meanwhile, activities supporting the digital economy include online transactions (14.95%) and accessing financial services (5.84%) (APJII, 2025). The above data implies that technology has become an inseparable part of people's lives, especially the younger generation. The majority of users also come from Gen Z (12-27) and Millennials (28-43). In other words, users are mostly from people of productive age, making the use of digital platforms a crucial element in supporting productivity.

3.2. Strengthening Digital Skills in Project-Based Assignments in Higher Education

Project-based assignments are a term often associated with activities in Project-Based Learning (PjBL). The term PjBL, or "project-based learning," is commonly used to describe various ways of organizing educational programs. A "project" typically refers to a task, or series of tasks, that focuses on a product and lasts for an extended period, typically two weeks or more. The final product is crucial, as most school projects culminate in a public demonstration or exhibition (EBSCO, 2024). The concept of PjBL is widely recognized as originating from the definition provided by Thomas (2005). The initial idea originated with John Dewey and was further developed by W.H. Kilpatrick, who advocated purposeful activities as a key link in the teaching process and the basis for effective learning (Chen & Yang, 2021). PjBL focuses on problem-solving, creativity, and real-world applications (Kurniawan et al., 2024). Therefore, learners in this model are encouraged to produce and present projects as creatively as possible to hone their critical thinking skills (Asfihana et al., 2022).

Integrating digital skills into Project-Based Learning (PjBL) is a viable approach to equip and familiarize students with the use of technology to produce projects. This integration does not eliminate conventional models, but rather encourages the use of digital skills to maximize existing capabilities. Currently, information dissemination

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

methods are quite diverse, ranging from audio and visual to a combination of both. The integration of digital skills into Project-Based Learning (PjBL) is targeted to produce high-quality products that meet professional standards. In today's digital era, one of the most popular jobs is content creation. Content creator jobs (such as graphic designers, video editors, and creative designers) are among the most popular digital products produced by the Indonesian industry. During the analysis period of 2021–2025, the number of requests for the content/content creation/creative designer/video editor/graphic designer categories reached 257,672 (Gayatri et al., 2023). These findings demonstrate the growing importance of content creators in various industries.

Project-Based Learning (PjBL) can help students acquire the skills needed for content creator jobs without compromising the core essence of education. Some products that can be produced through PjBL related to content include podcasts, infographics, and audiovisual displays that can be uploaded to popular platforms like YouTube. This can be done by converting learning materials and case studies into content such as podcasts, infographics, and videos. This can provide more interactive learning. Various studies have found that podcasts can provide better accessibility and flexibility in learning. Podcasts are easy to find and can be listened to regardless of time and place, thus facilitating learning anytime and anywhere (Mahyani et al., 2022; Sutrisno & Fajar, 2024). Users can also choose to listen directly or download them to save and listen anytime without an internet connection (offline). Podcasts have the advantage of providing users or listeners with control (Kesumaningtyas et al., 2022; Mahyani et al., 2022). Additionally, parents will find podcasts more convenient because they don't require a lot of internet data (Mahyani et al., 2022; Sutrisno & Fajar, 2024). Furthermore, podcasts save bandwidth due to their small digital file sizes when downloaded and uploaded (Mahyani et al., 2022).

In a career context, podcast production skills can be beneficial for professionalism in the workplace. Numerous podcasts offer educational insights into entrepreneurship, from the journey of starting a business to award-winning stories. This content is useful for improving theoretical understanding of entrepreneurship, leadership, organizational skills, and practical skills (Hutahaeen & Juhana, 2024). In general, the cognitive benefits of podcasts for students include improving communication and personal relationships. These skills are relevant and needed in various professional work environments (Hutabarat, 2023). By integrating these skills into PjBL, students can become accustomed to creating quality podcasts and absorb the various materials contained within them. This way, when students enter the workforce, particularly in the creative industry, they can be more adaptable to various tasks assigned by their employers, thus contributing to user satisfaction. Furthermore, podcasts can enhance portfolios required during job recruitment. Prospective employees with relevant portfolios have added value compared to their competitors.

In addition to podcasts, infographics have become a contemporary medium for learning. Infographics are generally defined as the visual display of various data,

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

information, and designs (Budiman & Kodri, 2024) or are also referred to as visual representations of collections of data, information, and designs (Budiman & Kodri, 2024; Masluhah et al., 2022). Wicaksono, Satria Agung & Pujosusanto (2024) define infographics as the display of data, ideas, information, or knowledge through charts, graphs, schedules, and other means, so that they can be presented more than just text and have a strong and engaging visual impact. Infographics can compact complex data without compromising the core substance of the information being presented. Infographics present engaging visuals and help audiences understand an explanation quickly.

Infographics, in several studies, have a positive impact on student learning outcomes and comprehension. One study was conducted on third-grade students in Arts and Crafts Learning in elementary schools. The results showed a significant impact on improving student learning outcomes and proven effective in improving student understanding of the subject matter (Budiman & Kodri, 2024). This is partly because infographics can help students grasp each key point within a learning theme (Tanjung & Lubis, 2024). Infographics simplify information through visualization, making it easier to understand. This helps students grasp the essence of the information quickly and clearly (Sudewi et al., 2025). By understanding the main points in a learning theme, students can explore those key points in greater depth and, in turn, improvise on various materials related to them. Ultimately, this can promote time efficiency in understanding a material without limiting students' creativity and critical thinking.

Another product of digital skills is a combination of audio and visuals, or video. Video products can be uploaded and accessed on popular digital platforms like YouTube and Instagram. Videos provide an engaging learning experience because they can display illustrations of the material being presented, making it easier for students to understand. Additionally, the audio combination can provide a comfortable learning experience for students. YouTube has a vast and varied library of instructional videos covering a wide range of academic and professional topics. This content can accommodate various learning styles and serve as a useful alternative to traditional learning (Hayirli, 2025). In fact, various studies have shown the positive impact of YouTube on developing academic skills, particularly in English language acquisition among students (Hudri et al., 2025). Similar to podcasts and infographics, learning through video platforms like YouTube can be done flexibly without being limited by space and time.

In the context of this research, producing instructional videos for students can be a means of developing their competencies and skills. Instructional videos can enhance students' cognitive development, improving their ability to think critically, analytically, and creatively (Hayirli, 2025). Furthermore, several studies have found improvements in explicitly technology-related skills, such as software learning, after watching YouTube videos (Shoufan & Mohamed, 2022). YouTube can also be used as an instrument to shape independent and creative student character (Rahmatika et al., 2021). Vlog production and role-playing activities also help enhance creativity in learning (Hudri et al., 2025). These

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

various studies demonstrate the benefits of video content production both in learning and in honing digital skills. This ultimately leads to optimism that familiarizing students with content-based projects can equip them with the skills they will need when entering the workforce. This strategy must continue to be encouraged so that students are not only competitive in existing jobs but also create new jobs in the digital and related industries. Podcasts, infographics, and videos each have their own advantages and disadvantages. However, all three are attractive products for learning in the digital age. Furthermore, students can utilize various platforms to produce these products, including Corel Draw, Canva, and Adobe Premiere. Students' familiarity with these tools can help them hone various digital skills, such as design and editing. These are skills that cannot be learned instantly, so becoming accustomed to using these tools can improve their professional skills. Without eliminating assessment methods such as written exams or paper writing, these three products can serve as alternative outputs for assignments. Considering the potential and benefits of producing these three types of content, integrating digital skills into Project-Based Learning (PjBL) is a strategic move for lecturers and educators.

3.3. Actors' Synergy and Future Job Opportunities

In this part, the authors analyze the related actors' role and how digitalization open new opportunities in the future. To facilitate analysis, the author created the following mind map to categorize various important aspects of this research.

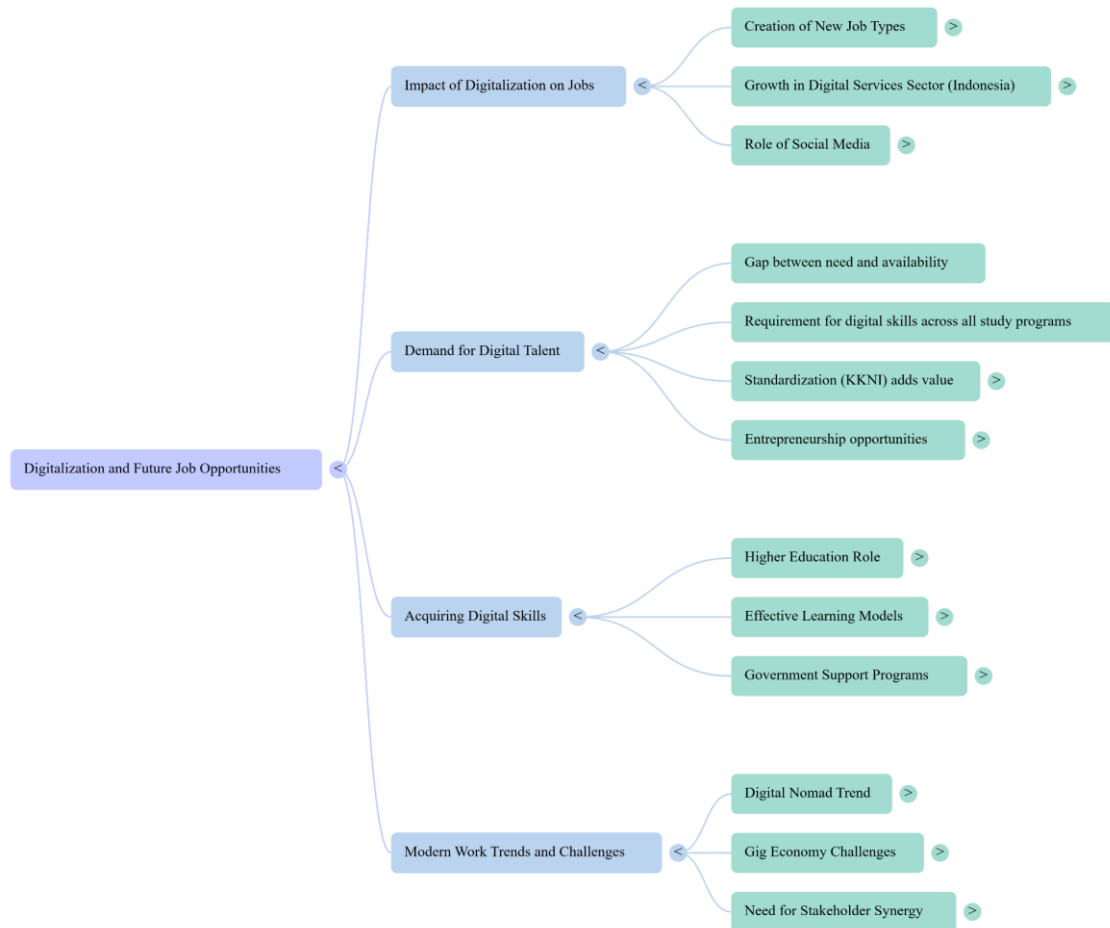


Fig 1. Mind Map of Actors' Synergy and Future Job Opportunities in this Digital Era
 Source: Processed by authors from various sources

Digitalization has created new jobs that never existed before. Digital influencer is one job clearly related to content creation. Other new job types include software developers, data analysts, digital marketers, cybersecurity specialists, and big data analysts (Rosadi & Tomy, 2025). The study also shows a growing trend in the digital services sector. The digital services sector in Indonesia has shown a rapid increase in the number of workers, from 300,000 in 2018, to 500,000 in 2020, and to 750,000 in 2023 (Rosadi & Tomy, 2025). This data shows that the digital services sector is becoming increasingly strategic each year. Therefore, equipping graduates with digital skills is a relevant step.

Digital skills in content creation are in demand in today's job market. In a digital context, these skills are understandably crucial for businesses across various industries, especially those seeking to achieve business goals such as increasing brand awareness, marketing, generating leads, or increasing profits (Hira, 2023). Both government and private institutions view these skills as essential for today's workforce. Nearly every government agency, for example, has channels on various social media platforms like Instagram and YouTube. This demonstrates the transparency of state institutions with the public regarding public information. On the other hand, companies often use social media

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

to market their products and build a positive reputation through various platforms. Meanwhile, MSMEs maximize social media to build engagement with consumers. This situation illustrates the increasingly central role of social media in various aspects.

The increase in jobs in the digital services sector demands or increases the demand for digital talent. The previous section mentioned the gap between the need for and the availability of digital talent in the job market. Therefore, higher education plays a crucial role in producing digital talent, ensuring a balance between the demand and supply of digital talent. The need for digital talent here is not limited to the availability of majors related to digital business, informatics, communication technology, and the like, but also includes other study programs that incorporate digital skills into their teaching and learning activities. In this context, Project-Based Blended Learning (PjBL) can be an ideal model for fostering student creativity and honing their digital skills. A study found that the Digital Project-Based Blended Learning (DPBBL) model statistically significantly improved critical thinking and problem-solving skills in students (Rahman et al., 2025).

Furthermore, students with digital skills (ICT skills) are classified according to the Indonesian National Qualifications Framework (KKNI) as professional workers with complementary and specialist skills (expert group), as well as ICT technicians, analysts, and managers (technical and analytical group) (Gayatri et al., 2023). This standardization adds value to students with such skills, making it easier for them to find future employment, particularly in the digital services sector. As a form of support from policymakers, it is necessary to develop an industrial transformation roadmap (as implemented in Singapore) that provides information on the impact of technology, career paths, required skills, and reskilling options (Jagannathan & Geronimo, 2021). The government itself has facilitated this by providing free digital training programs such as "Digitalent" to address the challenge of poor digital literacy among teachers and students (Rasimin et al., 2024). This program needs to be promoted more widely and inclusively to increase the number of beneficiaries. This will foster positive synergy between academics and policymakers in improving graduates' digital skills.

Despite the numerous opportunities in the digital services industry, graduates with advanced digital skills can become entrepreneurs and create new jobs. The Indonesian Ministry of Trade noted that the number of e-commerce users in Indonesia has continued to increase since 2020, reaching 58.63 million by 2023. They also estimate that the number of e-commerce users in Indonesia will continue to increase, reaching 99.1 million by 2029 (Indonesian Ministry of Trade, 2024). Consequently, the need for digital talent, such as content creators and IT experts, will also increase, leading to a growing and strategic number of jobs in the digital industry.

Furthermore, working as a digital influencer is a promising career because it can be done by anyone with affordable capital. According to the latest data, Indonesia ranked fifth in the world as the country with the largest number of influencers in 2024, with a total of 863,000 accounts, or approximately 3.6% of the global total. Indonesia's position is below Brazil, the United States, India, and Iran, which top the list (Fadhila, 2025). Meanwhile,

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

the total number of content creators in Indonesia has reached 17 million, of which 8 million make this their primary occupation. 63 percent of them earn above the minimum wage (UMR) (Hamurwati, 2025). Armed with digital skills acquired through university, higher education graduates can try their luck as content creators or digital influencers.

Modern developments and technological advances in the employment context in general have given rise to the so-called "digital nomad" trend, defined as individuals who work remotely or online without being tied to a single location. This type of work has become popular in Indonesia since the government announced the possibility of hybrid work (Pramudya et al., 2024). This allows individuals to work more flexibly, allowing them to manage their time independently regarding when and where they work. However, there are challenges associated with the so-called gig economy. The gig economy refers to a work system in which companies increasingly rely on part-time freelance workers on short-term contracts (Jagannathan & Geronimo, 2021). While seemingly flexible, this economic model faces various challenges, such as a lack of social protection, excessive working hours, and workers not protected by minimum wage guarantees, insurance, or collective bargaining agreements (Jagannathan & Geronimo, 2021). In fact, the gig economy and labor market informality in general are closely linked to issues of poverty and inequality (Sulintang et al., 2024). Therefore, strong synergy between stakeholders is needed to produce high-quality and competitive digital talent. This synergy can be achieved according to their respective roles, for example, the government as regulator and facilitator, the private sector as provider of training and competency enhancement, and academics, who play a crucial role in providing theoretical foundations for digital skills. This way, the need for digital talent in the Indonesian labor market can be met.

4. Conclusion

This study concludes that shifting employment trends in Indonesia have increased the demand for digital talent. Digital talent, in this case, relates to the criteria for graduates who possess expertise in information and technology and multimedia skills. Currently, there is a curriculum gap that is one of the reasons why the quality of human resources cannot meet the needs of the job market. Therefore, higher education has a crucial role to play in addressing this gap. This can be done by adopting and integrating digital skills into the curriculum. Furthermore, learning models in Indonesia are now more varied, one of which is project-based learning (PjBL). PjBL encourages students to think more critically and creatively in producing a product. By integrating digital skills into PjBL, students can hone their digital skills to produce content-based products such as podcasts, infographics, and audio-visual content relevant to current job trends. However, this growing trend also brings challenges that arise in the gig economy with its various risks. To achieve superior and resilient human resources in facing these challenges, synergy is needed across all actors, including the government as regulator and facilitator, the private sector as training and capital providers, and academics, who play a crucial role in

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

producing quality graduates. This synergy is crucial for producing digital talent that adapts to shifting employment trends in Indonesia.

References

- Al-Abdullatif, A. M., & Gameil, A. A. (2021). The Effect of Digital Technology Integration on Students' Academic Performance through Project-Based Learning in an E-learning Environment. *International Journal of Emerging Technologies in Learning (IJET)*, 16(11), 189. <https://doi.org/10.3991/ijet.v16i11.19421>
- Anatan, L., & Nur. (2023). Micro, Small, and Medium Enterprises' Readiness for Digital Transformation in Indonesia. *Economies*, 11(6), 156. <https://doi.org/10.3390/economies11060156>
- APJII. (2025). *Highlight Survei Penetrasi Internet dan Segmentasi Pasar ISP 2025*. APJII.
- Asfihana, R., Salija, K., Iskandar, I., & Garim, I. (2022). Students' English Learning Experiences on Virtual Project-Based Learning Instruction. *International Journal of Language Education*, 6(2), 196. <https://doi.org/10.26858/ijole.v6i2.20506>
- Azanda, S. H., Syah, R. F., & Ayunda, W. A. (2024). MAKNA EMPAT PILAR LITERASI DIGITAL DAN POTENSINYA MENEKAN PEREDARAN HOAX DI RUANG DIGITAL INDONESIA. *National Conference on Applied Business, Education & Technology*, 3(1), 764–773. <https://doi.org/10.46306/ncabet.v3i1.167>
- Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/QRJ0902027>
- Budiman, I. A., & Kodri, S. (2024). Pengaruh Penggunaan Media Pembelajaran Infografis Terhadap Hasil Belajar Siswa Kelas 3 dalam Pembelajaran Seni Budaya dan Prakarya di Sekolah Dasar. *JURNAL MANAJEMEN PENDIDIKAN DAN ILMU SOSIAL*, 5(5), 2248–2253. <https://doi.org/10.38035/jmpis.v5i5.2661>
- Chen, H., & Yang, J. (2021). Application of IT-integrated Project-Based Learning in the Teaching Reform of Undergraduate Education. *International Journal of Emerging Technologies in Learning (IJET)*, 16(05), 248. <https://doi.org/10.3991/ijet.v16i05.21085>
- Corbin, J., & Strauss, A. (2008). Basics of Qualitative Research (3rd ed.): Techniques and Procedures for Developing Grounded Theory. *SAGE Publications*, 3. <https://doi.org/10.4135/9781452230153>
- Disnaker Buleleng. (2025). *Perubahan Dinamika Tenaga Kerja di Era Digital | Dinas Tenaga Kerja*. Bulelengkab.go.id. https://disnaker.bulelengkab.go.id/informasi/detail/artikel/48_perubahan-dinamika-tenaga-kerja-di-era-digital
- EBSCO. (2024). *Project-Based Learning*. EBSCO Information Services, Inc. | www.ebsco.com. <https://www.ebsco.com/research-starters/education/project-based-learning>

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

- Fadal, K. (2020). Kontra-Radikalisasi Agama Pusat Studi Al-Qur'an Jakarta. *MUTAWATIR*, 10(1), 48–73. <https://doi.org/10.15642/mutawatir.2020.10.1.48-73>
- Fadhila, F. (2025, October 22). *Indonesia Masuk 5 Besar Dunia Jumlah Influencer Terbanyak*. Rri.co.id; RRI. <https://rri.co.id/hobi/1917535/indonesia-masuk-5-besar-dunia-jumlah-influencer-terbanyak#:~:text=KBRN%2C%20Jayawijaya:%20Industri%20influencer%20di,baru%20bagi%20para%20konten%20kreator.>
- Gayatri, G., Jaya, I. G. N. M., & Rumata, V. M. (2023). The Indonesian Digital Workforce Gaps in 2021–2025. *Sustainability*, 15(1), 754. <https://doi.org/10.3390/su15010754>
- Ghosh, R., Chan, W. Y. A., Manuel, A., & Dilimulati, M. (2016). Can education counter violent religious extremism? *Canadian Foreign Policy Journal*, 23(2), 117–133. <https://doi.org/10.1080/11926422.2016.1165713>
- Hamurwati, S. A. (2025, June 15). *Indonesia Penghasil Konten Kreator Terbesar di Asia Tenggara*. Rri.co.id; RRI. <https://rri.co.id/hiburan/1583483/indonesia-penghasil-konten-kreator-terbesar-di-asia-tenggara#:~:text=Total%20kreator%20konten%20di%20Indonesia,kegiatan%20ini%20sebagai%20pekerjaan%20utama.>
- Hari, S., & Prihantoro, N. E. (2023). Kominfo's Cybercreation Digital Literacy in Social Media. *International Journal of Scientific Research in Science and Technology*, 10(6), 79–86. <https://doi.org/10.32628/ijrst5231066>
- Hayirli, O. (2025). YouTube as an Educational and Self-Development Tool. *European Journal of Teaching and Education*, 7(1), 89–108. <https://doi.org/10.33422/ejte.v7i1.1461>
- Hira, A. (2023, November 7). *10 Jenis Digital Skill yang Dibutuhkan Bisnis Saat Ini*. MarkPlus Institute. https://markplusinstitute.com/explore/jenis-digital-skill/?srsltid=AfmBOoqlTnH0CgTr_Jsb64CFPWnUft2GDL9hqOgAU2eLR11P_6EsmLq
- Hudri, M., Iman, N. H., & Ilham. (2025). Students' Perceptions of Youtube as A Learning Medium for Enhancing Speaking Skills in English Language Acquisition at Universitas Muhammadiyah Mataram. *IJLECR - INTERNATIONAL JOURNAL of LANGUAGE EDUCATION and CULTURE REVIEW*, 11(1), 79–88. <https://doi.org/10.21009/ijlecr.v11i1.53584>
- Hutabarat, P. M. (2023). *PENGEMBANGAN PODCAST SEBAGAI MEDIA SUPLEMEN PEMBELAJARAN BERBASIS DIGITAL PADA PERGURUAN TINGGI*. UI Scholars Hub. <https://scholarhub.ui.ac.id/jsht/vol2/iss2/11>
- Hutahaeen, C. N., & Juhana, A. (2024). Study Literature Review : Pemanfaatan Podcast sebagai Media Edukasi dalam Dunia Pendidikan. *Edudikara Jurnal Pendidikan Dan Pembelajaran*, 8(3), 134–138. <https://doi.org/10.32585/edudikara.v8i3.348>

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

- Jagannathan, S., & Geronimo, D. (2021). *Reaping the Benefits of Industry 4.0 through Skills Development in Indonesia*. <https://doi.org/10.22617/spr200327>
- Kemendag RI. (2024). *PERDAGANGAN DIGITAL (E-COMMERCE) INDONESIA PERIODE 2023*. Kemendag.go.id. <https://satudata.kemendag.go.id/ringkasan/produk/perdagangan-digital-e-commerce-indonesia-periode-2023>
- Kesumaningtyas, S., Anjani, D. F., Yumerda, D., & Nugraha, D. (2022). Pengembangan Media Audio Berbasis Podcast dalam Pembelajaran Digital: Peran dan Kegiatan Ekonomi Masyarakat. *Edukatif*, 4(4), 5331–5341. <https://doi.org/10.31004/edukatif.v4i4.2896>
- Komdigi. (2024). *Pengembangan Talenta Digital dalam Menghadapi Tantangan pada Era Perubahan*. Badan Pengembangan Sumber Daya Manusia Komunikasi Dan Digital. <https://bpsdm.komdigi.go.id/berita-pengembangan-talenta-digital-dalam-menghadapi-tantangan-pada-era-perubahan-46-1926>
- Kurniawan, D., Masitoh, S., Bachri, B. S., Wahyuningsih, T., Mulawarman, W. gede, & Vebibina, A. (2024). Evaluation of Digital Project Based Blended Learning Model to Improve Students' Critical Thinking and Problem Solving Skills. *Journal of Ecohumanism*, 3(8). <https://doi.org/10.62754/joe.v3i8.4847>
- LPKIA. (2025, February 25). *7 Fakta Menarik Tentang Kebutuhan Talenta Digital Di Indonesia - LPKIA*. INSTITUT DIGITAL EKONOMI. <https://lpkia.ac.id/kebutuhan-talenta-digital-indonesia/>
- Mahyani, A., Fitri, S., Zaqiah, Q., & Priatna, T. (2022). Inovasi Teknologi Pendidikan Melalui Podcast Sebagai Suplemen Pembelajaran di Sekolah. *Tsamratul Fikr*, 16(2), 117–126.
- Masluhah, Afifah, K. R., & Hafid, A. (2022). Efektivitas media pembelajaran berbasis infografis terhadap hasil belajar siswa pada mata pelajaran IPS. *Jurnal Teori Dan Praksis Pembelajaran IPS*, 7(1), 11–11. <https://doi.org/10.17977/um022v7i12022p11>
- Moleong, L. J. (2012). *Metodologi penelitian kualitatif*. Pt Remaja Rosdakarya.
- Pramudya, A. W. E., Beni, H., & Wempi, J. A. (2024). Digital Nomad Work Trends in Indonesia After the Pandemic. *International Journal of Science and Society (Online)*, 6(1), 116–126. <https://doi.org/10.54783/ijssoc.v6i1.1000>
- Prasetyawati, A. N., & Astuti, A. P. (2025). Implementation Project Based Learning - STEAM on Student's Creative Thinking Skill in Indonesia : a Bibliometric Review. *Journal of Lesson Study and Teacher Education*, 4(1), 66–75. <https://doi.org/10.51402/jlste.v4i1.158>
- Rahman, R., Zaki, A., & Pratama, Y. A. (2025). The Effect of Project-Based Learning on 21st Century Skills in Middle School Students in Indonesia. *Lingeduca: Journal of Language and Education Studies*, 4(1), 17–23. <https://doi.org/10.70177/lingeduca.v4i1.2125>

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

- Rahmatika, Yusuf, M., & Agung, L. (2021). The Effectiveness of Youtube as an Online Learning Media. *Journal of Education Technology*, 5(1), 152. <https://doi.org/10.23887/jet.v5i1.33628>
- Rakhmawan, S. A. (2022). Digital Transformation of Informal Workers in the New Normal Era: “Can It Be the Solution We Are Searching For?” *East Java Economic Journal*, 6(2), 182–207. <https://doi.org/10.53572/ejavec.v6i2.87>
- Rasimin, N., Semma, A. B., Zakiyuddin, N., Ali, M., & Helmy, M. I. (2024). Multi-dimensional challenges in the Indonesian social science information technology-based learning: A systematic literature review. *Heliyon*, 10(7), e28706–e28706. <https://doi.org/10.1016/j.heliyon.2024.e28706>
- Rosadi, R., & Tomy, C. (2025). Dampak Ekonomi Digital Terhadap Ketenagakerjaan Di Indonesia. *Benefit: Journal of Bussiness, Economics, and Finance*, 3(1), 77–82. <https://doi.org/10.70437/benefit.v3i1.1059>
- Sari, A. I., Suryani, N., Rochsantiningsih, D., & Suharno, S. (2020). Digital Learning, Smartphone Usage, and Digital Culture in Indonesia Education. *Integration of Education*, 24(1), 20–31. <https://doi.org/10.15507/1991-9468.098.024.202001.020-031>
- Shoufan, A., & Mohamed, F. (2022). YouTube and education: A scoping review. *IEEE Access*, 10(1), 125576–125599. <https://doi.org/10.1109/access.2022.3225419>
- Siberkreasi. (2023). *4 Pilar Literasi Digital – CABE (Cakap Aman Budaya Etika) – SIBERKREASI*. Siberkreasi.id. <https://gnld.siberkreasi.id/modul/>
- Smeru Institute. (2022). *Riset SMERU: Prospek ekonomi digital Indonesia terganjal ketimpangan keterampilan digital, apa yang bisa dilakukan pemerintah? | The SMERU Research Institute*. Smeru.or.id. <https://smeru.or.id/id/article-id/riset-smeru-prospek-ekonomi-digital-indonesia-terganjal-ketimpangan-keterampilan-digital>
- Sudewi, P. W., Putri, A. M. J., & Imansari, N. (2025). Implementasi Infografis sebagai Media dan Pendukung Pembelajaran Bahasa Inggris. *Jurnal ABDINUS : Jurnal Pengabdian Nusantara*, 9(1), 259–270. <https://doi.org/10.29407/ja.v9i1.23691>
- Sulintang, A., Saragih, T. S., Pramasanti, A. N., Mahaganti, F. S., Fitriani, K., Augustin, E., Putra, M. A., & Kara, S. B. (2024). Bibliometric analysis of Indonesia’s labor dynamics: Future works, digital transformations, and contemporary employment landscape shifts. *International Journal of Data and Network Science (Print)*, 8(2), 679–688. <https://doi.org/10.5267/j.ijdns.2024.1.010>
- Sutrisno, & Fajar, W. N. (2024). Pemanfaatan Media Podcast Sebagai Inovasi Pembelajaran di Era Generasi Z. *Proceedings Series on Social Sciences & Humanities*, 19, 231–233. <https://doi.org/10.30595/pssh.v19i.1358>
- Tanjung, J. H., & Lubis, F. (2024). PENGGUNAAN INFOGRAFIS SEBAGAI MEDIA PEMBELAJARAN TERHADAP KEMAMPUAN MENULIS TEKS DESKRIPSI. *JGK (Jurnal Guru Kita)*, 8(4), 709. <https://doi.org/10.24114/jgk.v8i4.61718>

PROSIDING

The 7th International Conference on Technology, Education, and Social Science
“Driving Innovations for Inclusive and Sustainable Growth: Shaping the Future of Education, Law, Agriculture, Food Technology, Economy, Politics, And Society”

- Wardhana, M. A., Lestari, E., & Nikmah, M. (2024). Strengthening The Competitiveness of Indonesian Industry Human Resources Through IQF-Based Workplace Learning. *Jurnal Ilmiah Manajemen Dan Bisnis*, 9(2), 169–184. <https://doi.org/10.38043/jimb.v9i2.5674>
- Wicaksono, Satria Agung, & Pujosusanto, A. (2024). PENGEMBANGAN INFOGRAFIS INTERAKTIF TEMA SCHULE DENGAN APLIKASI ADOBE XD SEBAGAI MEDIA PEMBELAJARAN BAHASA JERMAN FASE F. *LAT*, 13(02), 1121. <https://ejournal.unesa.ac.id/index.php/laterne/article/view/62688>