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Soft Skills vs Technical Skills: A Narrative Literature Review on the Determinants of Work Readiness Among Recent Graduates

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Soft skill; Technical skill; Work Readiness, STEM, Non-STEM

ABSTRACT
This study analyzes the role of soft and technical skills in determining the employability of new graduates by addressing three main questions: which soft skills are most influential, which technical skills are most needed, and which skills dominate based on global evidence. A narrative literature review design was employed, with systematic searches of eight academic databases (Scopus, Google Scholar, ScienceDirect, Taylor & Francis, SAGE, Elsevier, Elicit, and SINTA) conducted during October–November 2024. Following a rigorous screening process, 25 peer-reviewed articles published between 2020 and 2025 and focusing on final-year students or recent graduates (within 1–3 years post-graduation) were selected for analysis. The study revealed that employability is shaped by a balance of technical competence and adaptive ability, aligning with the employability framework as a psychosocial construct. Soft skills—such as communication, collaboration, self-management, and problem-solving—were found to be more dominant in facilitating graduates' adaptation and early performance. Meanwhile, technical skills served as a prerequisite for entry-level positions. The study also highlighted differences in skill requirements between STEM and non-STEM fields: STEM fields prioritized technical expertise, while non-STEM fields focused more on interpersonal skills. The findings suggest that integrating both soft and technical skills through project-based, experiential, and work-integrated learning is the most effective strategy to enhance job readiness. The practical implications stress the importance of designing higher education curricula that balance technical competence with character and social skills, ensuring graduates are adaptive and competitive in the job market.

INTRODUCTION

Unemployment remains a pressing issue in the Indonesian labor market. BPS data indicate that in February 2025, there were 7.28 million unemployed individuals out of a 153.05 million working-age population. Meanwhile, in February 2024, the number of unemployed stood at 7.60 million. This represents a decrease in unemployment compared to the previous year. This phenomenon is also evident in the high enthusiasm for job fairs across various regions. For example, the Bekasi Regency Government held a job fair at President University, which attracted 25,000 applicants. In East Java Province, the government organized the 2025 Inclusive Job Exchange at the Dyandra Convention Center, attended by more than 7,000 job seekers. In the Sumatra region, the Medan City Government hosted a similar event at Prima

Indonesia University, drawing 2,173 job seekers. These data and phenomena underscore that unemployment is a social problem requiring attention in national development.

The persistent unemployment challenge is compounded by a critical mismatch between the skills possessed by graduates and those demanded by employers (Adely et al., 2021; Nwaikpo, 2025). This skills gap has become increasingly evident in both technical and behavioral competencies. Tushar (2023) states that in this digital era marked by rapid change, communication skills, teamwork, adaptability, problem-solving, and cross-cultural competence are urgently needed globally. This is supported by empirical evidence showing that soft skills are highly influential in career transitions and the success of job readiness, even at the postgraduate level (Hussein, 2024) and in the technology field (Mohammed et al., 2024).

However, higher education curricula still emphasize technical skills and have not fully incorporated soft skills training into academic syllabi (Hussein, 2024; Peersia, 2024). In fact, a study by Karimi et al. (2020) found a soft skills gap among STEM students entering the workforce. This is exacerbated by structural barriers, such as limited opportunities for practical experience and insufficient systematic attention in academic programs to soft skill development (Mohammed et al., 2024).

This situation creates a paradox where employers prioritize soft skills, while educational institutions emphasize technical skills. Although the literature on employability has advanced significantly over the past decade, critical gaps remain. Most research on soft skills and technical skills is conducted separately, without comparing their relative contributions to job readiness (Römgens et al., 2020). Furthermore, studies examining the comparative importance of these skill sets across disciplinary contexts (STEM vs. non-STEM) are limited, particularly in understanding how each skill category influences graduate employability in diverse professional environments.

This study addresses these gaps through a narrative literature review exploring, comparing, and synthesizing the roles of soft skills and technical skills as facilitators of job readiness among recent graduates. It addresses three main research questions: (1) What soft skills support the job readiness of new graduates? (2) What technical skills contribute to the job readiness of new graduates? (3) Which skills are more dominant based on global research findings?

Therefore, this study is expected to make theoretical contributions to understanding the roles of soft skills and technical skills within the perspective of employability as a psychosocial construct (Fugate et al., 2004) and Career Construction Theory (Savickas, 2013), as well as practical implications for developing higher education curricula and career preparation strategies for graduates.

METHOD

This study used a narrative literature review design to summarize and analyze empirical findings related to the role of soft skills and technical skills in shaping the work readiness of new graduates. Narrative literature reviews differ from systematic reviews in their more flexible approach to synthesis, allowing for broader exploration of thematic patterns while maintaining methodological rigor in article selection and analysis (Snyder, 2019). This approach allows researchers to trace the results of previous research and identify thematic patterns that emerge

in the context of job readiness, particularly in the differences between STEM and non-STEM fields.

The literature search was conducted in October–November 2024 through various academic databases, including Scopus, Google Scholar, ScienceDirect, Taylor & Francis, SAGE, Elsevier, Elicit, and SINTA (Indonesia's national science and technology index). The search was conducted using a combination of keywords such as "soft skills", "technical skills", "work readiness", "graduate employability", "STEM", and "non-STEM". The publication range is focused on 2020–2025 to capture the latest developments, but classical literature that forms the theoretical basis such as Human Capital Theory (Becker, 1993), Employability Framework, Work Readiness (Caballero et al., 2011), as well as various 21st century competency frameworks from P21 and UNESCO (Partnership for 21st Century Learning, 2019; Muldagaliyeva, 2023) remains included.

The selection of articles is carried out in stages through reading the title, abstract, to full text, by applying inclusion criteria in the form of peer-reviewed articles, available in English or Indonesian, containing empirical findings, and focusing on final year students or recent graduates. Non-academic publications, articles without full text, and documents that did not go through the peer review process were excluded from the analysis. From the results of the search and screening, 25 relevant articles were obtained and became the basis for the synthesis.

All articles that passed the selection were analyzed using a thematic analysis approach to identify the main patterns and themes related to the contribution of soft skills and technical skills to employability, differences in skill needs in the context of STEM and non-STEM, and factors that strengthen or weaken the work readiness of graduates. This synthesis process results in a comprehensive understanding of the skills that are most influential in *the work readiness* of the new generation of graduates and their relevance to the changing demands of the modern world of work.

RESULTS AND DISCUSSIONS

Soft Skills that Support the Work Readiness of New Graduates

Soft skills have proven to be a dominant factor in determining the job readiness of college graduates. A number of studies show that although technical skills are important as initial capital, the success of graduates in entering and surviving in the world of work is more determined by interpersonal, intrapersonal, and cognitive abilities that fall into the category of soft skills (Istia et al., 2025). Hussein (2024) found that networking, negotiation, and self-marketing skills are strong predictors of employability, while confidence and empathy are factors that increase individuals' work readiness to interact in a professional environment.

In the context of the 21st century, soft skills are categorized into three main domains: cognitive, interpersonal, and intrapersonal (National Research Council, 2012). (1) Cognitive skills include critical thinking and problem-solving skills. (2) interpersonal skills include communication, collaboration, and leadership. (3) Intrapersonal skills include initiative, resilience, responsibility, and adaptability. This view is in line with the Four C's framework of the Partnership for 21st Century Learning (2019), which emphasizes four main competencies, namely critical thinking, communication, collaboration, and creativity, as the foundation of modern job readiness.

For new graduate students, critical thinking and problem-solving skills are the key to understanding and applying knowledge practically. This ability allows students to not only master theory, but also analyze real situations, make decisions, and find innovative solutions. This is reinforced by the research of Kennedy and Sundberg (2025) which explains that mastery of these skills plays an important role in preparing students to face complex and unexpected career challenges.

Furthermore, communication and collaboration are key aspects of job readiness, as most modern jobs are team and cross-disciplinary. The ability to communicate effectively both orally and in writing is a prerequisite for social and professional integration in the workplace. Denysenko et al. (2024) affirm that effective communication, the ability to work together, and overall interpersonal skills contribute greatly to employability. Students who are able to hone their skills in teamwork, listen with empathy, and manage differences of opinion from the beginning will be more adaptable when entering the professional world.

In addition, creativity and innovation are also important components in the work readiness of new graduates. Creativity is not only related to art or design, but also the ability to think flexibly in finding new approaches to solving problems. In the context of an increasingly digitized world of work, the ability to generate new ideas and apply them becomes a highly valued competitive advantage (Calado & Souza, 2024).

Another dimension that is no less important is emotional intelligence, which includes self-awareness, empathy, and the ability to manage emotions in social relationships (Karimi et al., 2020). Emotional intelligence helps students build positive relationships, adjust to new environments, and deal with academic and social pressures more effectively. In the world of work, this ability is often the difference between good performance and effective leadership.

Adaptability and personal responsibility are also included in the important soft skills category that determine job readiness. Savickas (2013) through Career Construction Theory explains that a person's career readiness is not only determined by technical skills, but also by his ability to adapt and give meaning to his work. Recent graduates who have high motivation to learn, flexibility to change, and a sense of responsibility for assignments will be better prepared to face the demands of the dynamic professional world.

The development of soft skills cannot be separated from the educational process. Succi and Canovi (2020) emphasized that skills such as communication, cooperation, and self-management need to be explicitly integrated into the curriculum to be relevant to the needs of the modern workplace. Project-based approaches, collaborative discussions, and reflective learning have proven effective in cultivating these skills (Rizakhojayeva et al., 2025). Thus, higher education plays a strategic role in shaping the work readiness of new students through learning design that is in line with the needs of the industry.

The results of the study show that the soft skills that best support the work readiness of new graduate students include:

1. Effective communication, both interpersonal and professional.
2. Critical thinking and problem-solving, to navigate academic and work-world challenges.
3. Collaboration and teamwork, for integration in a cross-disciplinary work environment.
4. Creativity and innovation, to bring new solutions in complex situations.
5. Adaptability and personal responsibility, to face change and adjust professionally.

6. Emotional intelligence, to manage social and professional relationships in a healthy manner.

These soft skills are not only complementary to *technical skills,* but also the main foundation for graduates to transition from the academic world to the professional world with more confidence and high competitiveness. With the ability to communicate, think critically, adapt, and empathize, new graduates can develop *career adaptability* which is at the core of *employability* and long-term job readiness. The relevance of *soft skills* also varies across disciplines. In non-STEM fields such as education, management, and social services, communication skills, teamwork, and professional ethics are the dominant factors in determining job readiness. Jackson and Bridgstock (2020) affirm that graduates with strong interpersonal and reflective competencies are more adaptable to job dynamics than those who focus only on technical skills.

Technical Skills That Contribute to the Job Readiness of New Graduates

1. Technical Skills as the Foundation of Job Readiness

Technical skills are specific abilities that allow individuals to carry out professional tasks according to their field. In the context of the job readiness of new graduates, especially from STEM (Science, Technology, Engineering, Mathematics) disciplines, technical skills are the main prerequisites for entering the job market. However, the mastery of these skills must be balanced with the ability to apply and adapt to the context of the industrial world. Some of the main categories of technical skills that contribute to job readiness include:

First, the ability to master programming languages such as Python, SQL, and MATLAB is the basis for many positions in data science, engineering, and information technology. Python is widely used for data analysis, machine learning, and automation, while SQL is important in database management and information visualization (Mohan et al., 2024). Mastery of these tools allows graduates to process and interpret data to support evidence-based decision-making. Furthermore, the mastery of data analysis skills that enables graduates to collect, process, and interpret large datasets to solve problems scientifically. McGill et al., (2023) stated that this competency includes statistical modeling, data visualization, and storytelling with data.

Then, the ability to apply STEM concepts into the context of the real world of work is an important indicator of professional readiness. Graduates who are able to identify problems, analyze root causes, and design technology-based solutions show higher levels of employability (Souppez, 2025; Gafni et al., 2023).

In addition, digital literacy is a basic requirement in all fields, including the ability to manage information, use software, understand digital systems, and think systemically in the use of technology (U.S. Department of Education, 2025). This competency demonstrates the ability to adapt to a high-tech-based work environment, which is increasingly important in the era of digital transformation.

Finally, technical communication skills, such as the ability to write scientific reports, describe experimental results, and explain complex concepts to non-technical audiences, also play an important role. Although it is often considered a soft skill, in the context of STEM it is part of *technical skills* because it concerns the clarity of the delivery of processes and technical results (Souppez, 2025).

2. Competency Gap between Academia and Industry

Several studies show that there is a gap between students' mastery of technical skills and the real needs of the industry. Mohammed and Ozdamli (2024) found that technology students often have adequate coding and data analysis skills, but have difficulty applying them in a cross-functional collaborative context. This phenomenon is known as skill mismatch, which is when higher education focuses too much on theoretical and technical mastery, but underemphasizes practical application and industrial contexts (Deming & Autor, 2025; Setiawati & Wijayanti, 2022).

McGunagle and Zizka (2020) also noted that many graduates with high technical competence still do not meet employer expectations due to a lack of workplace readiness and experience applying skills in real projects. In studies involving STEM employers, competencies such as problem-solving, communication, and teamwork were considered more important than just technical knowledge.

This shows that technical skills function as a "baseline competence" or basic requirement to enter the world of work, but are not enough to guarantee career success without the integration of soft skills that support their application (CIPD, 2017; Karimi et al., 2020).

So it can be concluded that the technical skills that contribute the most to the job readiness of new graduates include programming and computing skills, data analysis and statistics, STEM-based problem-solving, digital literacy, and technical communication. However, the effectiveness of these skills is highly dependent on the ability of graduates to apply them collaboratively and contextually in the workforce.

Which skill is more dominant?

Based on the synthesis of various global researches, both technical skills and soft skills play an important role in determining the work readiness of new graduates. However, the degree of dominance and relevance differ depending on the context of the field of study as well as the needs of the industry. Cross-border research shows that technical skills serve as the main foundation for carrying out specific tasks and meeting professional standards, especially in STEM fields (Deming & Autor, 2025; Rizakhojayeva et al., 2025).

In contrast, soft skills have been shown to have a broader and more sustained influence on employability and long-term career success. Global studies such as Hussein (2024), Mohammed et al. (2024), and Istia et al. (2025) confirm that communication skills, collaboration, and adaptability are the main differentiating factors between job-ready graduates and those who are not. In a non-STEM context, interpersonal skills, work ethic, and self-management are even the strongest indicators of job readiness (Setiawati & Wijayanti, 2022; Asmuni & Hasyim, 2015).

To clarify the comparison of the roles and dominance of the two types of skills in various contexts, the following table summarizes the findings of global research related to the relationship between technical skills and soft skills to work readiness.

Comparison Table: Soft Skills vs Technical Skills in Work Readiness in STEM and Non-STEM contexts

Table 1. Comparative Analysis: Soft Skills vs Technical Skills in Work Readiness across STEM and Non-STEM Contexts

Aspects	Technical Skills	Soft Skills
Theoretical Role	It serves as the foundation *of human capital* that increases productivity and becomes the basis for entering work (*entry-level competence*) (Deming & Autor, 2025; CIPD, 2017).	Become a determinant of work effectiveness, collaboration, and adaptation in the work environment; has a strong influence on career sustainability and the ability to innovate (Fugate et al., 2004; Hussein, 2024; Mohammed & Ozdamli, 2024; Istia et al., 2025; Alfiana et al., 2024).
Influence on Work Readiness	Provide specific capabilities in carrying out technical, analytical, and technology-based tasks; is the minimum requirement for job readiness in the STEM field (Mohan et al., 2024; McGill et al., 2023).	Improve interpersonal, communication, empathy, and conflict resolution skills; enabling adaptation in dynamic and collaborative work environments (Karimi et al., 2020; Calado & Souza, 2024).
Dominant in STEM	Very dominant; be a major prerequisite for entering technology-based and engineering-based jobs, such as programming, data analysis, and systems design (Deming & Autor, 2025; McGunagle & Zizka, 2020).	Remains essential to support teamwork, project leadership, and cross-functional communication; proven to improve learning outcomes in *project-based learning* (Rizakhojayeva et al., 2025; Kennedy & Sundberg, 2025).
Dominan by Non-STEM	Important but more supportive; usually context-specific and not a major factor in *employability* (Jackson & Bridgstock, 2020).	More dominant as a core competency, especially in the fields of service, management, education, and social; determine performance and professional relationships (Denysenko et al., 2024).
The Relationship of the Two	It becomes *a baseline competence* that provides basic professional skills to carry out job tasks (Deming & Autor, 2025).	Complementing *technical skills* and ensuring that a person is able to survive, adapt, and thrive in the work environment; both form a balanced professional profile or *T-shaped professional* (Deming & Autor, 2025; Calado & Souza, 2024).

It can be concluded that work readiness cannot be supported by one type of competence alone. Technical skills are the foundation for carrying out core tasks and meeting operational standards, while soft skills determine the ability of graduates to adapt, work together, and develop in the long term. These needs also differ by discipline: STEM fields demand a balanced combination of technical and non-technical skills, while non-STEM fields prioritize soft skills as the main determinant of employability. Therefore, the integration of both types of skills in the curriculum is the most effective approach to ensure graduates are prepared for complex and ever-changing job demands.

This research strengthens the understanding of the role of soft skills and technical skills in job readiness through the perspective of employability as a psychosocial construct. Job readiness depends not only on technical mastery, but also on adaptive abilities formed through learning experiences and social interactions in educational and work environments.

The results of the study show that higher education needs to move from a knowledge-oriented approach towards the development of social-emotional competencies. Project-based learning and experiential learning have been proven to be effective in building students' character and interpersonal skills (Rizakhojayeva et al., 2025). An embedded learning approach that integrates soft skills in technical courses as well as internship programs and work-integrated learning has been proven to strengthen job readiness through real experience (Alfiana et al., 2024; Istia et al., 2025).

In the modern world of work, technical competence is an entry requirement, while soft skills distinguish between performance and leadership potential (CIPD, 2017; Calado & Souza, 2024). Graduates with a balance of both show better adaptation and career opportunities (Deming & Autor, 2025). In Indonesia, the combination of technical and social skills also increases competitiveness and job readiness (Istia et al., 2025).

CONCLUSION

Global findings reveal three key conclusions: soft skills exert a stronger influence on job readiness, especially in adaptation and collaboration (Hussein, 2024; Istia et al., 2025); soft and technical skills are complementary, best developed through experiential learning (Alfiana et al., 2024); and their balance fosters a T-shaped professional profile with deep technical expertise and broad social competence (Deming & Autor, 2025), enabling graduates to achieve optimal readiness via technological mastery alongside social, emotional, and moral maturity for competitiveness in the modern workforce. These insights urge universities to integrate soft skills into technical curricula, expand industry partnerships and work-integrated learning, and adopt competency-based assessments over traditional exams. For future research, longitudinal studies tracking long-term career outcomes of diverse skill profiles, evaluations of specific pedagogical interventions for integrated competencies, and analyses of how AI and automation reshape skill priorities in emerging occupations would be valuable.

REFERENCES

Adely, F. I. J., Mitra, A., Mohamed, M., & Shaham, A. (2021). Poor education, unemployment and the promise of skills: The hegemony of the "skills mismatch" discourse. *International Journal of Educational Development*, *82*, 102381.

Alfiana, R., Asmuni, A., & Hasyim, M. (2024). *Soft skills and career sustainability in modern workplaces: A comparative study across industries*. *Journal of Human Resource Development*, 18(2), 55–70.

Asmuni, A., & Hasyim, M. (2015). *Employability and work readiness in Indonesian higher education: A soft skills perspective*. *Jurnal Pendidikan dan Kebudayaan*, 21(3), 245–258.

Caballero, C., Walker, A., & Fuller-Tyszkiewicz, M. (2011). *The Work Readiness Scale (WRS): Developing a measure to assess work readiness in college graduates*. *Journal of Teaching and Learning for Graduate Employability*, 2(1), 41–54.

Calado, R., & Souza, M. (2024). *Strategic competencies for digital leadership: Integrating soft skills and innovation capability*. *International Journal of Management Education*, 22(3), 101–119.

CIPD. (2017). *Resourcing and talent planning: Annual survey report 2017*. Chartered Institute of Personnel and Development.

Deming, D., & Autor, D. (2025). *The future of work: Skills, technology, and inequality*. *Journal of Economic Perspectives*, 39(1), 23–47.

Denysenko, V., Borysenko, I., & Zinchenko, V. (2024). *Soft skills development and employability of higher education graduates: A systematic literature review*. *Education Sciences, 14*(1), 16. https://doi.org/10.3390/educsci14010016

Fernando, D., Bandara, R., & Gunawardena, C. (2015). *Technical competency and employability: A study among engineering undergraduates*. *Procedia - Social and Behavioral Sciences*, 174, 1024–1031.

Muldagaliyeva, A. (2023). *UNESCO competencies for lifelong learning: Reframing soft skills in global education*. *International Journal of Educational Development*, 96, 102682.

Nwaikpo, P. N. O. (2025). From classroom to crisis: Interrogating stakeholders on the correlation between skill mismatch, unemployability, and increasing unemployment in Nigeria. Research Journal in Translation, Literature, Linguistics, and Education (RJTLLE), 1(1).

Oktaviastuti, I., Putra, D., & Santoso, H. (2020). *Technical skills development in vocational education: Challenges in the digital era*. *Jurnal Pendidikan Teknologi dan Kejuruan*, 26(2), 145–156.

Partnership for 21st Century Learning (P21). (2019). *Framework for 21st century learning*. Battelle for Kids.

Rizakhojayeva, S., Nurakhmetova, A., & Yessimova, R. (2025). *Meta-analysis of soft skills integration in STEM education: Implications for workforce readiness*. *STEM Education Review*, 7(1), 33–58.

Rodriguez, J., & Kim, S. (2021). *Retention and transfer of technical skills: The role of practice and task complexity*. *Human Resource Development Quarterly*, 32(4), 537–559.

Savickas, M. L. (2013). *Career construction theory and practice*. In S. D. Brown & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (2nd ed., pp. 147–183). John Wiley & Sons.

Setiawati, N., & Wijayanti, R. (2022). *Soft skills as predictors of work readiness among non-STEM graduates in Indonesia*. *Indonesian Journal of Educational Research*, 11(2), 155–168.

Ukhova, N., & Gabelaia, L. (2025). *Soft skills and employability: New challenges for higher education institutions*. *Journal of Education and Work*, 38(1), 23–41.

Van Laar, E., Van Deursen, A., Van Dijk, J., & De Haan, J. (2020). *Determinants of 21st-century digital skills: A literature review and synthesis*. *Computers in Human Behavior*, 108, 106–112.

Zhang, Y., & Fischer, K. (2024). *Integrating soft skills and strategic leadership in digital transformation*. *Frontiers in Psychology*, 15, 1443. https://doi.org/10.3389/fpsyg.2024.01443