ISSN : 2962-9195 E-ISSN : 2963-8992

Journal of Educational Management Research
Vol. 05 No. 01 (2026) : 699-711
Available online at https://serambi.org/index.php/jemr

Managing Digital Technologies and Soft Skills to Enhance Graduate Employability: The Mediating Role of Psychological Well-Being in Higher Education

Efrita Norman[1]*, Melly Nuryani[2], Enah Pahlawati[3], Lina Marliani[1]
[1]Universitas Islam Bunga Bangsa Cirebon, Indonesia
[2]Sekolah Tinggi Agama Islam Al Mukhlisin, Indonesia
[3]University of aviation College, Malaysia
Email : efritanorman@gmail.com

DOI: https://doi.org/10.61987/jemr.v5i1.1748

Keywords:
Digital technologies, soft skills, graduate employability

**Corresponding Author*

ABSTRACT

This study aims to synthesize empirical evidence on the relationships among Industry 4.0–driven digital technologies, soft skills development, psychological well-being, and graduate employability in higher education, with particular attention to mediating and moderating mechanisms. A Systematic Literature Review (SLR) was conducted following PRISMA 2020 guidelines using the Scopus database, applying inclusion criteria related to publication year (2020–2025), document type, language, subject area, and relevance, resulting in 21 empirical studies analyzed through thematic analysis. The findings indicate that digital technologies function as conditional enablers of soft skills, demonstrating stronger effects when embedded in experiential and participatory pedagogies; digital learning environments also show ambivalent effects on psychological well-being, enhancing engagement when well designed but generating stress when pedagogical and organizational support is inadequate. Furthermore, soft skills consistently emerge as dominant predictors of employability beyond technical skills alone, while psychological well-being plays a crucial mediating role in the relationship between digital technologies, soft skills, and career outcomes, with leadership, organizational culture, and learning ecosystems acting as key moderating factors. These findings imply that higher education institutions must adopt integrated educational management strategies that balance digital innovation with soft skills development and psychological well-being to sustainably enhance graduate employability in the Industry 4.0 era.

Article History:
Received: October 2025; Revised: November 2025; Accepted: December 2025

Please cite this article in APA style as:
Norman, E., Nuryani, M., Pahlawati, E., & Marliani, L. (2026). Managing Digital Technologies and Soft Skills to Enhance Graduate Employability: The Mediating Role of Psychological Well-Being in Higher Education. *Journal of Educational Management Research, 5*(1), 699-711

INTRODUCTION

The rapid transformation of higher education in the era of Industry 4.0 has become a critical issue for society, as universities are increasingly expected to prepare graduates who are not only technically competent but also adaptable, resilient, and employable in highly dynamic labor markets. Digital technologies such as learning platforms, simulations, analytics, and online collaboration tools are widely promoted as solutions to enhance learning quality and workforce readiness. However, technology alone does not automatically translate into better outcomes. Its societal relevance lies in how effectively it contributes to human development, social mobility, and economic sustainability. Empirical evidence shows that graduates' success in the labor market depends not only on digital proficiency but also on soft skills and psychological readiness to navigate complex work environments (Haleem et al., 2022; Dávila-Laguna et al., 2025). Consequently, understanding how digital transformation in higher education can holistically support human capital development is essential for societies seeking inclusive growth and sustainable development. This research is therefore important because it addresses the broader societal challenge of aligning digital innovation in education with meaningful employability outcomes.

Despite the widespread adoption of digital technologies, higher education institutions face persistent societal problems related to graduate unemployment, skill mismatch, and declining well-being among students. Many graduates enter the labor market with strong technical knowledge but limited soft skills such as communication, teamwork, leadership, and adaptability, which employers increasingly value (Dewi, 2025; Kusumawati, 2025; Najiburohman et al., 2025; Syafiih, 2025). At the same time, intensified digital learning environments may unintentionally contribute to stress, technostress, and burnout when institutional support and pedagogical design are insufficient. These conditions create a paradox in which technological advancement coexists with declining employability outcomes and student well-being. Prior studies indicate that digital technologies rarely exert a direct effect on employability; instead, their impact depends on pedagogical integration and institutional readiness (Haleem et al., 2022). This general problem highlights a gap between societal expectations of higher education and the actual outcomes experienced by graduates. Addressing this gap requires a deeper understanding of the mechanisms linking digital transformation, human skills development, psychological well-being, and employability.

In practice, field phenomena across higher education institutions reveal uneven outcomes of digital transformation initiatives. While some universities successfully leverage simulations, project-based learning, and service-learning to foster soft skills and engagement, others struggle with superficial digitalization

focused primarily on administrative efficiency. Students often report mixed experiences: digital tools enhance flexibility and access but also introduce cognitive overload and reduced social interaction. Empirical studies show that soft skills tend to develop more effectively in experiential and collaborative learning environments, particularly when supported by authentic digital tools (Kupis et al., 2025; Fang et al., 2025; Mohammed & Ozdamli, 2024). Conversely, poorly designed digital learning environments can undermine psychological well-being and learning quality (Saleem et al., 2024; Avcı, 2025). These contrasting realities illustrate that digital technologies function as conditional enablers rather than universal solutions. Understanding these real-world dynamics is crucial for designing higher education systems that genuinely enhance employability while safeguarding students' psychological health.

Existing literature has extensively examined digital transformation in higher education, focusing on technology adoption, digital competencies, and innovative pedagogies (Holid, 2025; Nuraini et al., 2025; Yahya, 2023). Numerous studies highlight the potential of Industry 4.0 technologies to support active learning, collaboration, and skills development when embedded in experiential pedagogical strategies (Haleem et al., 2022; Fang et al., 2025; Kupis et al., 2025). Parallel research streams emphasize the growing importance of soft skills as central components of employability and early career success, often surpassing technical skills alone (Mohammed & Ozdamli, 2024; Pianda, 2024). Additionally, emerging studies address psychological well-being in digital learning contexts, identifying both positive and negative effects depending on design quality and institutional support (Saleem et al., 2024; Avcı, 2025; Neagu & Vieriu, 2025). However, these strands of research largely remain fragmented, addressing technology, soft skills, and well-being in isolation rather than as interconnected elements within a unified framework.

The fragmentation of prior research reveals a significant research gap. While individual studies acknowledge that digital technologies influence employability indirectly, few systematically integrate soft skills and psychological well-being as core explanatory mechanisms. Moreover, existing reviews often lack an explicit focus on mediation and moderation processes that explain why similar technologies produce different outcomes across institutional contexts (Barzansky & Fuentealba, 2024; Pianda, 2024). As a result, higher education leaders and policymakers have limited evidence-based guidance for designing curricula and institutional strategies that balance digital innovation with human-centered outcomes. Addressing this gap is essential, particularly in the context of Industry 4.0, where employability increasingly depends on the interaction between technological competence, human skills, and psychological resilience. This study positions itself within this gap by offering an integrative

synthesis that connects these dimensions into a coherent analytical framework.

The novelty of this study lies in its integrative and human-centered perspective on digital transformation in higher education. Rather than treating digital technologies as direct drivers of employability, this research conceptualizes them as conditional enablers whose effectiveness depends on soft skills development and psychological well-being. By synthesizing empirical studies published between 2020 and 2025, this Systematic Literature Review advances the state of the art by explicitly modeling psychological well-being as a mediating variable and institutional factors as moderators. This approach responds to calls for more holistic frameworks that move beyond technological determinism toward sustainable and inclusive educational transformation (Barzansky & Fuentealba, 2024). Resolving this issue is important because it enables higher education institutions to design learning ecosystems that support both performance and well-being, thereby producing graduates who are not only employable but also resilient and socially adaptive.

Based on the identified gaps, this study addresses the following research problem: how do Industry 4.0–based digital technologies influence graduate employability through soft skills development and psychological well-being in higher education contexts? The central argument proposed is that the relationship between digital technologies and employability is non-linear and mediated by human and psychological dimensions. Soft skills function as a bridge between digital learning experiences and labor market readiness, while psychological well-being determines whether these experiences translate into sustainable professional outcomes. Furthermore, curriculum design, institutional culture, and organizational support moderate these relationships, shaping their strength and direction. By articulating this argument, the study contributes theoretically by integrating human capital theory, well-being theory, and digital education research, and practically by offering insights for educational leaders seeking to align digital transformation with sustainable employability outcomes..

RESEACH METHOD

This study employed a qualitative Systematic Literature Review (SLR) design guided by the PRISMA 2020 framework to ensure a transparent, rigorous, and replicable review process (Niam et al., 2024). The SLR approach was deliberately selected instead of a narrative review because the relationship between Industry 4.0–based digital technologies, soft skills, psychological well-being, and employability is interdisciplinary and rapidly evolving. A systematic approach enables explicit documentation of search strategies, inclusion–exclusion decisions, and synthesis procedures, thereby minimizing selection bias and enhancing methodological robustness. Moreover, SLR is particularly

suitable for identifying patterns, mechanisms, and conceptual relationships across heterogeneous empirical studies, which aligns with the aim of synthesizing mediating and moderating pathways rather than merely summarizing findings.

The locus of the study was not a physical field site but a structured bibliographic database environment. Scopus was selected as the primary data source because it is one of the largest and most reputable international databases, providing broad coverage of peer-reviewed journals across education, social sciences, psychology, and management. This choice was justified by the need to capture high-quality, internationally indexed empirical studies that reflect recent developments in higher education during the Industry 4.0 period. The temporal scope of publications from 2020 to 2025 was chosen to ensure conceptual relevance, methodological currency, and alignment with post-pandemic digital transformation trends in higher education.

Data collection was conducted through a systematic search strategy using the Scopus database via the TITLE–ABS–KEY fields. The search query combined four core constructs: Industry 4.0 or digital technologies, soft skills or human skills, psychological well-being, and employability or work readiness within higher education contexts. The initial search yielded 777 documents. A multi-stage filtering process was then applied, including publication year, document type (articles only), language (English), subject area relevance, and topical relevance based on abstract and full-text screening. The selection process followed the PRISMA stages of identification, screening, eligibility, and inclusion, resulting in 21 articles that met all inclusion criteria and were included in the final synthesis.

Data analysis was conducted using thematic analysis to identify recurring patterns, relationships, and explanatory mechanisms across the selected studies. Following established qualitative synthesis procedures, extracted data included study context, type of digital technology, soft skills dimensions, psychological well-being indicators, employability outcomes, methodological approaches, and key findings. Themes were generated inductively and iteratively, resulting in four overarching themes: digital technologies as conditional enablers of soft skills, ambivalent effects of digital learning on psychological well-being, soft skills as determinants of employability and professional development, and mediating and moderating mechanisms shaping these relationships. Particular attention was given to identifying mediators such as psychological well-being and moderators such as institutional support, leadership communication, and organizational culture, as evidenced in studies using SEM, mixed methods, qualitative analysis, and prior systematic reviews (Dávila-Laguna et al., 2025; Saleem et al., 2024; Gigliotti & Alvarez-Robinson, 2025; Ufermann et al., 2025).

To ensure the trustworthiness and validity of the findings, several verification strategies were applied. First, methodological transparency was maintained through explicit reporting of search strings, screening stages, and inclusion–exclusion criteria in accordance with PRISMA 2020 guidelines. Second, triangulation was achieved by synthesizing evidence from diverse methodological designs, including quantitative, qualitative, mixed-methods, experimental, and systematic review studies. Third, consistency checks were conducted by comparing themes across studies and examining convergence or divergence of findings within similar contexts. Finally, the credibility of interpretations was strengthened by grounding all thematic conclusions in explicitly cited empirical evidence, thereby enhancing the reliability and confirmability of the synthesis.

RESULTS AND DISCUSSION

Digital Learning Beyond a Technocratic Perspective

The findings of this study challenge technocratic perspectives that position digital technologies and Industry 4.0 as direct and autonomous determinants of graduate employability. In line with contemporary digital learning literature, the synthesis demonstrates that digital technologies primarily function as enablers, whose impacts are highly contingent on pedagogical contexts and psychological conditions (Avcı, 2025; Ufermann et al., 2025). This confirms the argument that digital transformation in higher education should be understood as a socio-technical process rather than merely the adoption of technological tools (Gigliotti & Alvarez-Robinson, 2025).

From the perspective of Human Capital Theory, technology is expected to enhance graduates' labor market value through competence development. However, the findings of this review indicate that competence accumulation does not automatically translate into positive career outcomes in the absence of adequate psychological mechanisms. This insight extends the theoretical boundaries of Human Capital Theory by emphasizing that employability outcomes depend not only on skill acquisition but also on the psychological and contextual processes that enable skills to be effectively mobilized in professional settings.

Soft Skills as Necessary but Insufficient Conditions for Employability

Consistent with prior employability research, the findings under Theme 3 reaffirm that soft skills such as communication, leadership, and adaptability are critical determinants of work readiness and professional development (Dávila-Laguna et al., 2025; Pianda, 2024). However, this synthesis further reveals that soft skills constitute necessary but insufficient conditions for employability, as their effectiveness is strongly influenced by individuals' psychological states.

These findings align with the Job Demands–Resources (JD-R) Model, which conceptualizes digital technologies and intensified learning demands as potential job demands that may increase stress, while also recognizing their potential role as resources that enhance engagement when supported by appropriate pedagogical design and organizational support. Empirical studies on technostress in higher education highlight the crucial role of instructor and institutional support in maintaining learning quality and students' psychological well-being, which subsequently relates to professional readiness (Saleem et al., 2024; Avcı, 2025; Haleem et al., 2022).

Psychological Well-Being as a Central Mediating Mechanism

The main theoretical contribution of this article lies in repositioning psychological well-being as a central mediating mechanism rather than merely an outcome of digital learning. This proposition is strongly supported by empirical evidence from Dávila-Laguna et al. (2025), who explicitly modeled psychological well-being as a mediator between Industry 4.0 technology use, soft skills, and professional development.

From the perspective of Self-Determination Theory (SDT), digital learning environments that support autonomy, competence, and social relatedness are more likely to enhance psychological well-being and facilitate the internalization of soft skills relevant to employability. Empirical findings on students' digital well-being further demonstrate that the quality of online interactions and balanced technology use are closely associated with psychological well-being, which in turn relates to academic achievement and career readiness (Neagu & Vieriu, 2025; Mohammed & Ozdamli, 2024). These findings underscore the importance of psychological well-being as a key pathway through which digital learning experiences influence long-term professional outcomes.

Explaining Contextual Variability through Moderating Factors

Variations in findings across studies and institutional contexts can be explained by differences in organizational culture and institutional readiness. The Competing Values Framework (CVF) provides a useful analytical lens for understanding how organizational values such as flexibility versus control and

internal versus external orientation shape pedagogical practices, support mechanisms, and responses to digital disruption (Ataman & Safitri, 2024; Khotimah & FahmiSuhermanto, 2024; Maisuroh & Aisyah, 2024; Safitri, 2024).

Within the framework of Organizational Culture Theory, institutions characterized by cultures that emphasize innovation, collaboration, and participation (e.g., clan and adhocracy cultures) are better positioned to maximize the benefits of digital technologies for soft skills development and psychological well-being. In contrast, hierarchical and control-oriented cultures tend to intensify psychological pressures and weaken the positive impacts of digital learning (Ufermann et al., 2025). These findings highlight the importance of aligning digital transformation initiatives with institutional culture and context-sensitive organizational interventions.

Integration of Findings and Conceptual Advancement

By integrating the four thematic findings into a unified framework, this article demonstrates that the relationship between digital learning technologies and employability is indirect and sequential rather than linear. The capability pathway (soft skills development) and the psychological pathway (psychological well-being) operate simultaneously, while contextual factors such as pedagogical design, organizational culture, and leadership support act as moderators that either amplify or constrain these relationships.

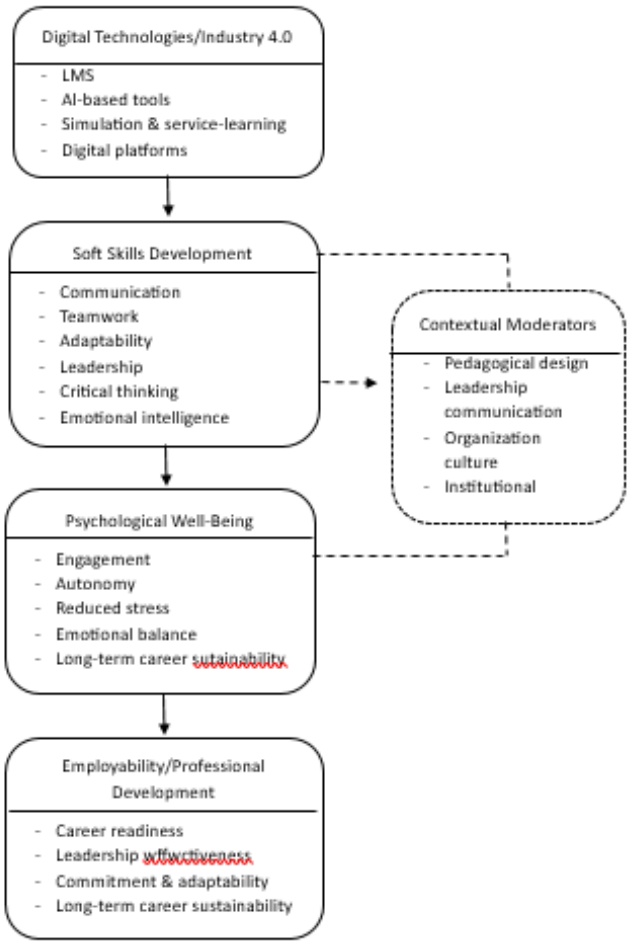

Figure 5. Integrated conceptual model illustrating the indirect relationship

between digital learning technologies and employability through soft skills development and psychological well-being, with pedagogical and organizational factors acting as contextual moderators.

This integrative model helps explain inconsistencies in previous literature that examined technology, skills, or employability in isolation. By foregrounding human and psychological dimensions, the model provides a more comprehensive theoretical foundation for understanding digital transformation in higher education and offers clearer guidance for institutions seeking to enhance graduate employability in the context of Industry 4.0.

CONCLUSION

This systematic literature review provides an important lesson: improving graduate employability in higher education cannot be achieved through the adoption of digital technology alone. Key findings indicate that the relationship between digital learning technologies, soft skills, and employability is indirect and gradual, operating through two key pathways: capability development (soft skills) and psychological mechanisms (psychological well-being). The key lesson from this research is that psychological well-being is a crucial prerequisite for the soft skills developed through digital learning to effectively transform into work readiness and professional development. When digital learning is designed supportively encouraging autonomy, engagement, and emotional balance technology serves as a learning resource. Conversely, without adequate pedagogical and organizational support, technology has the potential to become a stressor that undermines the impact of competency development.

In terms of scholarly contribution, this article strengthens and expands the employability literature by repositioning psychological well-being as a central mediator in the relationship between digital technology, soft skills, and professional outcomes, and integrating the role of contextual factors such as pedagogical design, leadership communication, and organizational culture as moderators. This contribution offers a more comprehensive conceptual framework for understanding the digital transformation of higher education as a socio-technical and psychological process. This study is limited by its reliance on literature from a specific timeframe and database, which restricts its ability to capture cross-cultural and contextual dynamics in education. Therefore, further research is recommended to test this conceptual model through quantitative or mixed-methods empirical studies, explore the role of other psychological variables such as self-efficacy and resilience, and compare the implementation of digital learning across different institutional contexts and disciplines to enrich our understanding of strategies for increasing sustainable employability.

REFERENCES

Ataman, A., & Safitri, S. D. (2024). Exploring complementary leadership styles in madrasahs by aiming at their impact on integrity and character development. *Business and Applied Management Journal*, 1(2), 118-133. https://doi.org/10.61987/bamj.v1i2.487

Dewi, A. T. A. (2025). Program guru penggerak dan peningkatan kompetensi pedagogik guru: Studi kasus di Balai Besar Guru Penggerak Jawa Timur. Universitas Islam Negeri Maulana Malik Ibrahim.

Holid, M. (2025). Principals' Role in the Application of Reward and Punishment Systems for Promoting Student Discipline in Pesantren-Based Schools. *Journal of Educational Management Research*, 4(2), 293-307.

Khotimah, H., & FahmiSuhermanto, S. (2024). Increasing The Competence of Islamic Religious Education Teachers from A Madrasah-Based Management Perspective. *Managere: Indonesian Journal of Educational Management*, 6(1), 13-26. https://doi.org/10.52627/managere.v6i1.388

Kusumawati, I. (2025). Ai-Based Human Capital As A Catalyst For Increasing The Strategic Agility Of Educational Organizations. *International Journal of Multidisciplinary Reseach*, 1(5), 239-245.

Maisuroh, S., & Aisyah, N. (2024). Connecting tradition with innovation: The impact of Wordwall on learning outcomes in Fiqh studies. *FONDATIA*, 8(3), 715-728. https://doi.org/10.36088/fondatia.v8i3.5294

Najiburohman, N., Hefniy, H., R., A. H. A., & Mohammad Abdul Aziz Alwahedi. (2025). Virtual School Tours: Boosting Community Interest and Attracting Prospective Students. *EVALUASI: Jurnal Manajemen Pendidikan Islam*, 9(2), 340-353. https://doi.org/10.32478/3gtzvf72

Niam, M. F., Rumahlewang, E., Umiyati, H., Dewi, N. P. S., Atiningsih, S., Haryati, T., Magfiroh, I. S., Anggraini, R. I., Mamengko, R. P., & Fathin, S. (2024). Metode penelitian kualitatif.

Nuraini, D., Jannah, N., & Meliana, A. (2025). Character Education Curriculum Adaptation Assistance to Build Students' Religious Culture. *Applied Community Services Journal*, 1(2), 75-86.

Safitri, S. D. (2024). Character Management in Crisis: Implementation of Five Day in Ma'had as a Social Care Solution in Elementary Madrasah. *JUMPA: Jurnal Manajemen Pendidikan*, 5(1), 57-68. https://doi.org/10.33650/jumpa.v5i1.9321

Syafiih, M. (2025). The Future Of Education In The Digital Era: Between Technological Innovation And Equitable Access. *Proceeding Of International Conference On Education, Society And Humanity*, 3(1), 737-741.

Yahya, M. (2023). Circuit Learning in Improving Concentration Student Learning in Madrasah. *PALAPA: Jurnal Studi Keislaman Dan Ilmu Pendidikan*, 11(1), 252-263 https://doi.org/10.36088/palapa.v11i1.3149

Asad, M. M., Erum, D., Churi, P., & Moreno Guerrero, A. J. (2023). Effect of technostress on psychological well-being of post-graduate students: A perspective and correlational study of higher education management. *International Journal of Information Management Data Insights*, 3(1), 100149. https://doi.org/10.1016/j.jjimei.2022.100149

Avcı, M. (2025). The double-edged sword of technology: Investigating the impact of technostress on students' psychological well-being and learning outcomes. *Computers & Education*, 245, 105540. https://doi.org/10.1016/j.compedu.2025.105540

Aziz, S. (2025). Soft skills development methods in higher education: A systematic literature review. *Higher Education, Skills and Work-based Learning*, 15(4), 868-883. https://doi.org/10.1108/HESWBL-02-2025-0050

Barzansky, B., & Fuentealba, C. (2024). ASPIRE for excellence: A revised framework and assessment of international excellence in medical education. *Medical Teacher*. https://doi.org/10.1080/0142159X.2024.2368565

Cameron, K. S., & Quinn, R. E. (1999). Diagnosing and changing organizational culture: Based on the competing values framework. Addison-Wesley.

Dávila-Laguna, R. F., Lizarzaburu Aguinaga, D., Caceres Torres, D. E., & Larroche Cueto, B. A. (2025). Soft skills and the use of Industry 4.0 as determinants of professional development in engineering graduates: A SEM approach. *Sustainable Futures*, 10, 100742. https://doi.org/10.1016/j.sftr.2025.100742

Fang, X., Jin, S., & Sun, Z. (2025). Application of practical training scenario simulation teaching method oriented to strengthen clinical skills in the clinical internship stage of medical students. *Medical Education Online*, 30(1), 2500557. https://doi.org/10.1080/10872981.2025.2500557

Gigliotti, R. A., & Alvarez-Robinson, S. (2025). The role of leadership communication in building crisis readiness and resilient leadership in times of disruption: An exploratory study. *Behavioral Sciences*, 15(9), 1260. https://doi.org/10.3390/bs15091260

Gong, L., Jiang, S., & Liang, X. (2022). Competing value framework and organizational performance: A meta-analytic review. *Journal of Business Research*, 145, 853-863. https://doi.org/10.1016/j.jbusres.2022.03.019

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education and their impact on learning. *Sustainable Operations and Computers*, 3, 275-285. https://doi.org/10.1016/j.susoc.2022.05.004

Kupis, K., Fouz, B., Maicas, S., & Sobieraj, I. (2025). The effectiveness of the service-learning method: A case study of the international "Superbugs" project. *Health Education Journal*, 84(8), 843-854. https://doi.org/10.1177/00178969251360507

Mohammed, F. S., & Ozdamli, F. (2024). A systematic literature review of soft skills in information technology education. *Behavioral Sciences*, 14(10), 894. https://doi.org/10.3390/bs14100894

Naamati-Schneider, L., & Alt, D. (2025). Health management students' perceived soft skills acquisition and university commitment. *BMC Medical Education*, 25, 521. https://doi.org/10.1186/s12909-025-07127-5

Neagu, S. N., & Vieriu, A. M. (2025). Digital and psychological well-being among technical university students: Exploring digital autonomy, work-life balance, and online interaction quality. *Education Sciences*, 15(9), 1192. https://doi.org/10.3390/educsci15091192

Pianda, D. (2024). The impact of internship experience on the employability of higher education graduates: Evidence from Indonesia. *Cogent Business & Management*, 11(1). https://doi.org/10.1080/23311975.2024.2386465

Quinn, R. E., & Rohrbaugh, J. (1983). A spatial model of effectiveness criteria: Towards a competing values approach to organizational analysis. *Management Science*, 29(3), 363-377. https://doi.org/10.1287/mnsc.29.3.363

Saleem, F., Chikhaoui, E., & Malik, M. I. (2024). Technostress, digital readiness, and psychological well-being in higher education: A systematic review. *Frontiers in Education*, 9, 1309642. https://doi.org/10.3389/feduc.2024.1309642

Ufermann, L., Domsch, H., & Urton, K. (2025). Perspectives of learning and support assistants on cooperation with teachers in inclusive education: A systematic literature review. *European Journal of Special Needs Education*. https://doi.org/10.1080/08856257.2024.2445407