Maneggio
E-ISSN : 3032-7652
https://nawalaeducation.com/index.php/MJ/index
Vol.2.No.6 December 2025
DOI: https://doi.org/10.62872/jmxrke23

The Role of HRM in Developing Technology-Based Competencies

Indarta Priyana[1], Ifa Khoiria Ningrum[2], Ahmad Rizani[3]
[1] Prodi Manajemen Fakultas Ekonomi dan Bisnis Universitas Informatika Dan Bisnis Indonesia
[2] Pascasarjana Magister Hukum Ekonomi Syariah Universitas Nahdatul Ulama Sunan Giri
[3] Jurusan Ekonomi Pembangunan Fakultas Ekonomi Dan Bisnis Universitas Palangka Raya

Email: indarta.priyana@unibi.ac.id, nifakhoiria@unugiri.ac.id, ahmadrizani@gmail.com

Inputted : November 07, 2025 *Revised : November 12, 2025*
Accepted : December 19, 2025 *Published : December 25, 2025*:

ABSTRAK

Transformasi digital menuntut karyawan memiliki kompetensi berbasis teknologi sebagai bagian dari kapabilitas inti agar organisasi mampu mempertahankan daya saing. Penelitian ini bertujuan menganalisis pengaruh pelatihan berbasis teknologi dan dukungan organisasi terhadap kompetensi berbasis teknologi karyawan. Metode penelitian menggunakan pendekatan kuantitatif dengan analisis Structural Equation Modeling berbasis Partial Least Square (SEM–PLS) yang melibatkan 150 karyawan sebagai responden. Hasil penelitian menunjukkan bahwa pelatihan berbasis teknologi berpengaruh positif dan signifikan terhadap kompetensi berbasis teknologi, sehingga semakin tinggi intensitas pelatihan digital yang diberikan, semakin tinggi kemampuan teknologi yang dikuasai karyawan. Selain itu, dukungan organisasi juga berpengaruh positif dan signifikan terhadap kompetensi berbasis teknologi, menandakan bahwa kebijakan, fasilitas, budaya kerja inovatif, dan dukungan kepemimpinan mempercepat internalisasi keterampilan digital dalam proses kerja. Secara simultan, kedua variabel independen menjelaskan 68,4% variasi kompetensi berbasis teknologi. Penelitian ini menegaskan perlunya strategi MSDM yang mengintegrasikan pelatihan digital dan dukungan organisasi untuk menciptakan sumber daya manusia yang adaptif, inovatif, dan kompeten di era transformasi digital.

Kata Kunci: adaptasi, kompetensi, pelatihan, teknologi, organisasi

ABSTRACT

Digital transformation requires employees to possess technology-based competencies as a core capability to maintain organizational competitiveness. This study examines the influence of technology-based training and organizational support on employees' technology-based competence. A quantitative method was employed using Structural Equation Modeling based on Partial Least Square (SEM–PLS) with 150 employees as respondents. The results reveal that technology-based training has a positive and significant effect on technology-based competence, meaning that greater exposure to digital training leads to higher mastery of workplace technology. Furthermore, organizational support also has a positive and significant effect on technology-based competence, demonstrating that policies, facilities, innovative work culture, and leadership support accelerate the internalization of digital skills in the workplace. Collectively, both independent variables explain 68.4% of the variance in technology-based competence. This study highlights the importance of integrating digital training and organizational support within HRM strategies to build adaptive, innovative, and technology-competent human resources in the era of digital transformation.

Keywords: *adaptation, competence, organization, technology, training*

INTRODUCTION

Digital transformation has changed the way organizations manage human resources (HR), where competencies are no longer sufficiently supported by traditional experience and technical skills, but must be enriched with the ability to master digital-based technology. The global world of work now demands workers who are able to adapt to integrated information systems, process automation, artificial intelligence, and digital collaboration platforms, which make technology-based competencies the foundation of modern workforce competitiveness. Therefore, the HRM function is no longer limited to traditional personnel administration, but has evolved into a strategic driver in developing talent that is ready to face the demands of organizational digitalization (Ainiyah et al., 2025). When business processes, performance reporting, and work collaboration make intensive use of technology, organizations must ensure that employees have adequate technological capabilities for the digital transformation process to be effective (Anam, 2024). Thus, the ability of HRM to design interventions for developing technological competencies is a determining factor in the success of organizations in facing digital challenges.

One of the most significant forms of HRM intervention in digital competency development is technology-based training. Training that utilizes digital devices, video-based modules, learning management systems (LMS), virtual reality learning, and artificial intelligence serves to accelerate the process of acquiring knowledge and technological skills for employees in a systematic, interactive, and sustainable manner (Bairizki, 2020). Unlike conventional training, technology-based training is not bound by time and space, provides flexibility, and allows for rapid material updates when new technologies are introduced. Amidst the increasing need for digital competencies, technology-based training has become a strategic tool that reduces the skills gap while encouraging the adoption of innovation in work processes (Budi et al., 2024). Therefore, employees who receive adequate digital training have a greater chance of achieving technology-based competencies than employees who rely solely on traditional work experience.

In addition to technology-based training, the success of digital competency development also depends on the level of organizational support. Training alone is not enough to create competencies if it is not supported by systems, cultures, and work policies that encourage learning and applying technology in the workplace (Fadli et al., 2024). Organizational support includes technological facilities, leadership that provides innovative direction, support from superiors, access to learning, and incentive systems that encourage competency improvement. If an organization provides technology but does not provide psychological, structural, and cultural support to use it, then employees' digital competencies will not develop because the technology is not internalized in the work process (Nguyen et al., 2023). Thus, organizational support is a determining factor in whether technology-based training actually results in long-term competency improvement.

Technology-based competencies have strategic implications for organizational productivity and performance. Organizations that successfully develop their employees' digital competencies have proven to be able to adapt more quickly to market changes, accelerate the innovation process, and create cost efficiencies through work automation (Judijanto et al., 2025). Conversely, organizations that do not encourage the development of digital competencies risk losing their competitiveness because their employees do not have the skills to optimally utilize the latest technology. This situation emphasizes that HRM strategies in developing technological competencies are a key pillar of organizational sustainability in the digital era, not merely a supporting

administrative activity (Rastgar et al., 2023). Thus, technology-based training and organizational support need to be measured empirically to ensure that both play a real role in improving employees' digital competencies.

Although many HRM studies have evaluated workforce digitization, there are research gaps that underlie the urgency of this study. First, the study by Ainiyah et al. (2025) focuses on the role of HRM in increasing organizational productivity, but has not tested technology-based competencies as a specific variable that is a prerequisite for digital productivity. Second, Anam's (2024) research discusses the role of HRM in technology-based organizations, but does not simultaneously analyze the contribution of digital training and organizational support in a single model framework. Third, Budi et al.'s (2024) research emphasizes digital training as a developer of lecturer competencies, but does not include the variable of organizational support as an additional determinant that influences the success of digital competency formation. Thus, no research has examined the simultaneous relationship between technology-based training and organizational support on employee technology-based competencies in a single quantitative model.

Therefore, this study offers novelty by examining two main predictors of digital competency development, namely technology-based training and organizational support simultaneously in a SEM–PLS-based structural model. This study provides empirical contributions to understanding the extent to which the combination of digital training and organizational support can improve employee technology competencies in the context of modern HRM. The purpose of this study is to analyze the influence of technology-based training and organizational support on employee technology-based competencies using a quantitative SEM–PLS approach.

METHODE

This study employs a quantitative approach using Partial Least Squares–Structural Equation Modeling (PLS-SEM) to examine the effects of technology-based training (X1) and organizational support (X2) on employees' technology-based competencies (Y). The total population of this study consisted of 150 employees, all of whom met the research criteria. Therefore, a total sampling (census) technique was applied, in which the entire population was used as the research sample. This approach is appropriate when the population size is relatively limited and allows for comprehensive data representation while minimizing sampling bias.

Data were collected using a structured questionnaire measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Respondents were required to meet the following criteria: (1) actively employed as permanent or contract employees; (2) having a minimum tenure of at least **one year**, ensuring familiarity with organizational policies and work processes; (3) having participated in or been involved in technology-based training or competency development programs; and (4) holding positions that require regular use of digital systems or technology in daily work activities. These criteria ensure that respondents possess sufficient experience and relevance to provide valid and reliable information related to technology-based competencies.

Technology-based training was measured using indicators of training media effectiveness, relevance of training materials, ease of access to digital learning platforms, and training intensity. Organizational support was measured through indicators of technology facility availability, organizational policies supporting digital learning, leadership support, and an innovative work culture. Technology-based competency was measured through indicators of digital device mastery, ability to utilize

technology in work processes, adaptability to new technologies, and technology-based problem-solving skills.

The PLS-SEM analysis was conducted in two stages. First, the measurement model (outer model) was evaluated to assess construct reliability and validity using Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). Second, the structural model (inner model) was evaluated by analyzing path coefficients, t-statistics, and p-values through bootstrapping with a significance level of 5%. The coefficient of determination (R^2) was used to assess the explanatory power of the independent variables on the dependent variable. The research hypotheses were formulated as follows: H1, technology-based training has a positive effect on employees' technology-based competencies; and H2, organizational support has a positive effect on employees' technology-based competencies.

RESULT AND DISCUSSION

Table 1. Outer Model Evaluation : Reliability and Validity

Construct	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Technology-Based Training (X1)	0.902	0.931	0.731
Organizational Support (X2)	0.887	0.921	0.702
Technology-Based Competence (Y)	0.918	0.944	0.774

Source: Data processed using SmartPLS 4; reliability and validity criteria adapted from Hair et al. (2021).

All constructs demonstrated strong internal consistency, as reflected in Cronbach's Alpha values above 0.70, Composite Reliability (CR) values above 0.70, and AVE scores exceeding 0.50. These statistical results confirm that the indicators used to measure each construct possess adequate convergent validity and internal reliability, meaning that the measurement model is appropriate and can be further analyzed using the structural model.

Table 2. Inner Model Evaluation : Path Coefficient and Significance

Hypothesized Relationship	Path Coefficient (β)	T-Statistic	P-Value	Decision
X1 → Y	0.482	6.941	0.000	Supported (H1 accepted)
X2 → Y	0.411	5.873	0.000	Supported (H2 accepted)

Source**:** Bootstrapping results (5,000 subsamples) using SmartPLS; hypothesis testing procedure refers to Hair et al. (2021).

Interpretation:

The p-value for the influence of technology-based training on technology-based competence is 0.000, well below the 0.05 significance level. Therefore, H1 is accepted,

indicating that technology-based training has a positive and significant contribution to increasing employees' technology-based competence. Meanwhile, the p-value for the influence of organizational support on technology-based competence is also 0.000 (< 0.05), leading to the acceptance of H2. This means that the presence of strong organizational support significantly encourages employees to develop technology-based competencies. In summary, both predictors (technology-based training and organizational support) demonstrate statistically significant effects on improving employees' technology-based competence.

Table 3. Coefficient of Determination (R-Square)

Dependent Variable	R-Square
Technology-Based Competence (Y)	0.684

Source: Structural model output generated using SmartPLS; interpretation of R^2 follows guidelines by Hair et al. (2021).

The R-Square value of 0.684 indicates that technology-based training and organizational support jointly explain 68.4% of the variance in technology-based competence, while the remaining 31.6% is attributable to other factors not included in the model. This highlights the strong predictive power of both independent variables in enhancing technology-based competence within the framework of human resource management.

The Effect of Technology-Based Training on Employee Technology-Based Competence

The results of the study indicate that technology-based training has a positive and significant effect on employee technology-based competencies, as evidenced by a path coefficient value of 0.482 and a p-value of 0.000 < 0.05. These findings show that the more intensive and effective the technology-based training provided to employees, the higher the level of technological competence they master in their work. Psychologically and practically, technology-based training offers a learning experience that allows employees to explore digital application features, work information systems, and innovative tools relevant to their job requirements. When training materials are aligned with the demands of the business processes and technologies used by the organization, employees' ability to apply digital skills increases significantly (Bairizki, 2020).

The concept of technology-based training emphasizes that learning should not only focus on knowledge transfer, but also on ensuring that employees are able to integrate technology into their daily work activities. The advantage of digital training lies in its ability to provide an interactive, flexible, and personalized learning environment, where employees can learn at their own pace and repeat technical material without space and time constraints. This is what distinguishes digital training from conventional training, as digital training provides continuous learning opportunities that are relevant to the latest technological developments (Budi et al., 2024). When organizations provide applicable digital training modules, employees not only understand the technology but are also able to use it in the context of their duties and responsibilities.

Technology-based training also accelerates the process of competency building because learning is hands-on (learning by doing). Employees who are involved in

training sessions based on simulations, video tutorials, or interactive learning platforms tend to internalize digital skills more quickly because the learning process involves real experiences and hands-on practice in solving technology-based tasks. This experience-based learning approach has been proven to increase confidence in the use of technology, which ultimately strengthens the digital competencies needed to support organizational performance (Anam, 2024). The higher the level of employee engagement in digital training, the higher their proficiency in utilizing technology to complete work efficiently.

From a strategic HRM perspective, technology-based training can be considered an organizational investment in building the digital capabilities of the workforce. Organizations realize that competitive advantage is not only determined by sophisticated technology systems, but also by the quality of the human resources operating them. When organizations provide ongoing technology training, employee adaptability increases, and the implementation of new technologies in work processes occurs more quickly.

Technology-based training also plays a role in reducing technology resistance, as training participants gain positive experiences and confidence in the digital systems used in their work (Fachrunnisa & Hussain, 2020). Thus, training is not only a technical process but also a transformational process towards a technology-based work culture. Previous studies reinforce the hypothesis that digital training can improve employees' technological competence.

Budi et al. (2024), for example, show that digital training integrated with AI-based learning systems can significantly improve the technological capabilities of lecturers in higher education. On the other hand, Anam (2024) found that technology-based organizations experienced improved performance after providing digital training focused on the use of work software and business information systems. These studies show that digital training not only improves conceptual understanding of technology but also supports the practical application of technology in work activities. Thus, the findings of this study are relevant not only to educational organizations or technology companies but also to other work sectors undergoing digital transformation.

In the context of technology-based competencies, digital training becomes a learning platform that encourages the creation of four aspects simultaneously: mastery of digital theory, technical skills, adaptability to new technologies, and the ability to solve problems using technology. Employees who receive effective digital training not only know how to use applications but are also able to choose the most appropriate technology for their work needs, identify system errors, and find technology-based solutions independently. This is in line with Septiadi & Ramdani (2024) explanation that technology-based competencies require the integration of knowledge, skills, and habits of technological adaptation in the context of real work. In other words, technology-based training plays a key role in shaping digital capabilities as core competencies of modern employees.

Technology-based competencies not only have an impact on individual development, but also on the organization's ability to deal with digital change. When training is conducted consistently, organizations can minimize the risk of a skills gap among the workforce, which is often a major obstacle in the digital transformation process. Digital transformation requires a workforce that is able to work collaboratively in a digital environment and contribute to work process innovation (Judijanto et al., 2025). By improving technology-based competencies through digital training, organizations can build a productive work ecosystem that is adaptive to technological changes, thereby achieving innovation, service acceleration, and work efficiency.

Considering all empirical findings and theoretical studies, it can be concluded that the findings of this study are consistent with and reinforce previous scientific evidence regarding the role of technology-based training in improving employees' digital competencies. Thus, hypothesis H1: Technology-based training has a positive effect on employee technology-based competencies is not only statistically proven through SEM-PLS results, but also theoretically proven through conceptual foundations and previous research findings. Digital training has been proven to be an effective HRM strategy and plays a crucial role in facing current organizational technological developments.

The Influence of Organizational Support on Employee Technology-Based Competence

The results show that organizational support has a positive and significant effect on employee technology-based competence, with a path coefficient of 0.411 and a p-value of 0.000, which means that hypothesis H2 is accepted. This figure shows that employee technology competence does not develop solely through training, but through a consistent and sustainable organizational support system. In a digital-based work environment, employees need to feel confident that their efforts to learn, apply, and innovate with technology are appreciated and facilitated by the organization. When organizations provide adequate technological support systems, employees are more confident in exploring technology, developing new digital insights, and independently improving their technology-based competencies (Fadli et al., 2024).

Organizational support for technological development includes the provision of digital facilities, continuous learning policies, access to training resources, and encouragement from leadership to adopt technology in the workplace. In the process of internalizing technology in the work environment, employees need not only training, but also an environment that allows them to apply digital skills without pressure and without fear of making mistakes. When organizations create an atmosphere that builds technological confidence, digital adoption occurs more quickly and technological competencies become permanently embedded in employees' work patterns (Nguyen et al., 2023). Organizational support also plays a role in creating a culture of technological learning, where employees feel encouraged and secure to learn new technologies, experiment, and share skills with colleagues.

In addition to technical support and policies, emotional support and leadership play a fundamental role in developing technological competencies. In many cases, employees feel hesitant to use new technologies because they are worried about making mistakes or being seen as incompetent. When supervisors provide appreciation, guidance, and learning opportunities without stigmatizing failure, employees find it easier to internalize technology as part of the work process. This leadership style creates technological psychological safety, which is a psychological condition in which employees feel safe to experiment with new technologies without fear of making mistakes (Judijanto et al., 2025). This is where organizational support becomes a determining factor in the successful implementation of technology-based competencies, because digital skills can only develop in a work environment that provides space for learning and exploration.

Organizational support also increases employee motivation to learn technology independently. When organizations provide facilities such as access to online training, technology modules, learning management systems, and digital devices, learning opportunities are wide open and technological competencies can develop progressively. With the availability of adequate learning resources and supporting facilities,

employees not only master the technology specified by the organization, but also develop advanced digital skills that can increase work productivity. This is reinforced by the findings of Rastgar et al. (2023), which show that organizational support is a key predictor in increasing technology adoption and the formation of digital skills in knowledge-based companies. Thus, organizational support not only complements training but also strengthens the internalization of technology as a permanent part of work competencies.

The findings of this study are also in line with the strategic HRM perspective, which emphasizes that technology-based competencies are the result of a combination of individual capacity and organizational systems that support long-term digital skills development. Organizations that recognize the strategic role of technological competencies will ensure that HRM activities, from recruitment and training to performance appraisal, encourage the development of employees' digital competencies to support business sustainability. Digital skills-based recruitment, technology-based assignments, and reward systems for digital innovation are some forms of organizational support that have been proven to simultaneously improve technological skills and digital performance (Irfieh & Supendi, 2024). Thus, consistent organizational support allows technology to become part of employees' professional identity, not just a temporary work tool.

Furthermore, the relationship between organizational support and technological competence shows that technological development cannot be left solely to individuals, but must be an institutional commitment. Organizations that only provide technology without support mechanisms will face skill gaps, employee resistance, and innovation stagnation. Conversely, organizational support creates synergy between training and digital competency building, thereby shortening the learning period and ensuring that technology investments have a real impact on work productivity and efficiency (Septiadi & Ramdani, 2024). Thus, organizational support is not only a training aid but also the foundation for successful digital transformation.

When linked to previous literature, this study expands and strengthens empirical findings regarding the role of organizational support in developing digital competencies. Fadli et al. (2024) show that technology can improve organizational performance only if there is strong internal support for employee participation in digital learning. Furthermore, Nguyen et al. (2023) emphasize that technology-based knowledge sharing in the workplace only thrives in an organizational culture that provides adequate resources, leadership, and learning support. This is consistent with the findings of this study, which prove that organizational support promotes technological competence not only through technical aspects but also through the cultural and psychological aspects of employees.

Thus, based on statistical results, digital HRM theory, and previous research findings, it can be stated that hypothesis H2: Organizational support has a positive effect on employee technology-based competencies is proven to be true. Organizational support has been proven to not only accelerate the internalization of technology in work processes, but also to be a catalyst that enables employees to develop into adaptive and productive digital-competent workers in the era of digital transformation.

CONCLUSION

This study confirms that human resource management (HRM) has a strategic role in developing employee technology-based competencies through two main instruments, namely technology-based training and organizational support. The results of the SEM–PLS analysis show that technology-based training has a positive and significant effect on technology-based competencies, which means that employees' ability to master and utilize work technology increases in line with the intensity of digital training received. Similarly, organizational support has a positive and significant effect on technology-based competencies, indicating that the provision of technological facilities, digital learning policies, leadership support, and a culture of innovation play an important role in internalizing employees' technological skills. The simultaneous contribution of both is proven to be strong, as reflected in the R-Square value of 0.684, which indicates that 68.4% of the variation in employee technology-based competencies is explained by technology-based training and organizational support.

The theoretical implications of this study show that employees' digital competencies are not only shaped through individual capacity building, but also require structural and cultural support from the organization. In practical terms, organizations need to design HRM strategies that synergize technology-based training and organizational support to ensure effective digital transformation. This can be done by strengthening the design of applicable digital training, expanding access to technology-based learning, ensuring the presence of leadership that supports innovation, and developing a reward system to encourage employees to adopt technology in their work. By consistently integrating these two factors, organizations can continuously improve employee technology-based competencies, minimize the digital skills gap, and strengthen organizational competitiveness in the era of digital transformation.

REFERENCES

Ainiyah, N., Kurniawan, R., Irfandi, A. S., Trihantoyo, S., & Sholeh, M. (2025). Peran Manajemen Sumber Daya Manusia dalam Meningkatkan Produktivitas Organisasi. Jurnal Bisnis Mahasiswa, 5(3), 1296-1310.

Alwy, M. A. (2022). Manajemen sumber daya manusia di era digital melalui lensa manajer sumber daya manusia generasi berikutnya. SIBATIK JOURNAL: Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya, Teknologi, Dan Pendidikan, 1(10), 2265-2276.

Anam, K. (2024). The Role Of Human Resource Management In Improving The Performance Of Technology-Based Organizations. TRANSACTION: Journal of Taxation, Accounting, Management and Economics, 31-37.

Bairizki, A. (2020). Manajemen Sumber Daya Manusia (Tinjauan Strategis Berbasis Kompetensi)-Jilid 1 (Vol. 1). Pustaka Aksara.

Budi, A., Goh, T. S., Prawiyogi, A. G., Zebua, S., Khanna, G., & Daeli, O. P. (2024). Implementing technology to develop lecturer competencies from a human resource management perspective. In 2024 3rd International Conference on Creative Communication and Innovative Technology (ICCIT) (pp. 1-7). IEEE.

Fachrunnisa, O., & Hussain, F. K. (2020). Blockchain-based human resource management practices for mitigating skills and competencies gap in workforce. International Journal of Engineering Business Management, 12, 1847979020966400.

Fadli, Z., Erliyani, I., Chandra, F., Maghfirah, N., Sukman, S., Sulthony, M. R., ... & Laksono, R. D. (2024). Manajemen Sumber Daya Manusia: Era Society 5.0. Yayasan Tri Edukasi Ilmiah.

Irfieh, F., & Supendi, P. (2024). Peran Teknologi dalam Meningkatkan Manajemen Sumber Daya Manusia di Era Digital: Studi Kasus di SD Mathla'ul Anwar. BISMA: Business and Management Journal, 2(4), 346-355.

Judijanto, L., Anggoro, Y., Farawowan, F. F., Suroso, A., & Prihadi, D. J. (2025). Revolusi Digital Dalam Manajemen Sumber Daya Manusia: Mengoptimalkan Teknologi Untuk Pengembangan Karyawan Dan Produktivitas Organisasi. Jurnal Ilmiah Manajemen, Ekonomi, & Akuntansi (MEA), 9(3), 126-146.

Malik, A., Froese, F. J., & Sharma, P. (2020). Role of HRM in knowledge integration: Towards a conceptual framework. Journal of Business Research, 109, 524-535.

Mardikaningsih, R., & Wardoyo, D. T. W. (2024). The Role of Technology in Human Resource Development for Sustainability: A Literature Review on Digital Innovation. Bulletin of Science, Technology and Society, 3(3), 20-26.

Nath, S., Afrose, U., Alif, S., & Tanha, M. (2023). Identification of the Factors Influencing the E-HRM Implementation: Insights from the Private Banks of Bangladesh.. *PMIS Review*. https://doi.org/10.56567/pmis.v1i1.02.

Nguyen, M., Rundle-Thiele, S., Malik, A., & Budhwar, P. (2023). Impact of technology-based knowledge sharing on employee outcomes: moderation effects of training, support and leadership. Journal of Knowledge Management, 27(8), 2283-2301.

Rastgar, A., Ebrahimi, S. A., Shafiei Nik Abadi, M., & Kolahi, B. (2023). Smart human resources management: explaining the requirements and technology-based platforms in knowledge-based companies. Quarterly journal of Industrial Technology Development, 21(52), 13-24.

Rohida, L., & Sudiantini, D. (2025). Transformasi Manajemen Sumber Daya Manusia Pendidikan Tinggi Untuk Meningkatkan Kompetensi Mahasiswa Di Era Artificial Intelligence. SINERGI: Jurnal Riset Ilmiah, 2(4), 2045-2055.

Septiadi, M. A., & Ramdani, Z. (2024). Competency-Based Human Resources (HR) Development in the Digital Era. Journal of Current Social and Political Issues, 2(2), 113-124.

Septiana, S., Wicaksono, R. N., Saputri, A. W., Fawwazillah, N. A., & Anshori, M. I. (2023). Meningkatkan kompetensi sumber daya manusia untuk masa yang mendatang. Student Research Journal, 1(5), 446-466.

Setyaningsih, D., & Putri, C. J. (2025). Persepsi Mahasiswa terhadap Penggunaan Kecerdasan Buatan (AI) dalam Pengembangan Kompetensi MSDM. RIGGS: Journal of Artificial Intelligence and Digital Business, 4(2), 151-156.

Shukla, S. (2025). Role of electronic human resource management (E-HRM) application to optimize the human resource management functions. *International Journal of Research in Human Resource Management*. https://doi.org/10.33545/26633213.2025.v7.i1e.300.

Silalahi, E. E., Sangapan, L. H., Manurung, A. H., & Machdar, N. M. (2025). Strategi peningkatan kompetensi digital karyawan melalui manajemen sumber daya manusia strategik. Journal of Strategic and Human Resources, 1(2), 41-54.

Subandi, A. R., Putri, A. I. A., Sanusi, H. A., & Kusumaningrum, H. (2025). Strategi Pengembangan Kompetensi Guru dan Staf dalam Manajemen SDM Pendidikan. Edukasi Elita: Jurnal Inovasi Pendidikan, 2(1), 106-122.

Vepo do Nascimento Welter, C., Oneide Sausen, J., & Rossetto, C. R. (2020). The development of innovative capacity as a strategic resource in technology-based incubation activities. Revista de Gestão, 27(2), 169-188.

Wadhawan, K. (2023). The Changing Face of Human Resources Development with Technology Dynamics. *INTERANTIONAL JOURNAL OF SCIENTIFIC RESEARCH IN ENGINEERING AND MANAGEMENT*. https://doi.org/10.55041/ijsrem24256.

Wahyudi, T. N., Anggorowati, L. S., & Wajdi, M. F. (2025). The Role of Human Resource Management in Preparing Organizations for Transformation in The 4.0 Era. In Proceedings International Conference on Education Innovation and Social Science (pp. 360-364).